F. THE SEA-LION (EUMETOPIAS STELLERI).

15. LIFE-HISTORY OF THE SEA-LION.

NATURAL INFERIORITY TO THE FUR-SEAL.—This animal, also a characteristic pinniped of the Pribylov islands, ranks much below the fur-seal in perfected physical organization and intelligence. It can, as well as its more sagacious and valuable relative, the *Callorhinus*, be seen, perhaps, to better advantage on these islands than elsewhere in the whole world that I know of. The marked difference between the sea-lion and the fur-seal up here, is striking; the former being twice the size of its cousin.

The size and strength of the northern sea-lion, *Eumetopias Stelleri*, its perfect adaptation to its physical surroundings, unites with a singular climatic elasticity of organization; it seems to be equally as well satisfied with the ice-floes of the Kamtchatka sea to the northward, or the polished bowlders and the hot sands of the coast of California.* It is an animal, as it appears upon its accustomed breeding-grounds at Northeast point, where I saw it, that commanded my admiration by its imposing presence and sonorous voice, rearing itself before me with head, neck, and chest upon its powerful fore-arms, over six feet in height; while its heavy bass voice drowned the booming of the surf that thundered on the rocks at its flanks.

THE PHYSICAL PRESENCE OF THE SEA-LION.—The size and strength of the adult sea-lion male will be better appreciated, when I say that it has an average length of ten and eleven feet, osteologically, with an enormous girth of eight to nine feet around the chest and shoulders; but, while the anterior parts of the frame are as perfect and powerful on land as in sea, those posterior are ridiculously impotent when the huge beast leaves its favorite element. Still, when hauled up beyond the reach of the brawling surf, as it rears itself, shaking the spray from its tawny chest and short grizzly mane, it has that leonine appearance and bearing, greatly enhanced, as the season advances, by the rich golden rufous-color of its coat, the savage gleam of its expression, due probably to the sinister muzzle and cast of its eye. This optical organ is not round and full, soft and limpid, like the fur-seal's, but it is an eye like that of a bull-dog, small, and clearly showing, under its heavy lids, the white or sclerotic coat, with a light brown iris. Its teeth gleam and glisten in pearly whiteness against the dark tongue and the shadowy recesses of its wide, deep mouth; the long, sharp, broad-based canines, when bared by the wrathful snarling of its gristled lips, glittered more wickedly, to my eye, than the keenest sword ever did in the hand of man.†

With these teeth alone, backed by the enormous muscular power of a mighty neck and broad shoulders, the sea-lion confines its battles to its kind, spurred by terrible energy and heedless and persistent brute courage. No animals that I have ever seen in combat presented a more savage or more cruelly fascinating sight than did a brace of old sea-lion bulls which met under my eyes near the Garden cove at St. George.

SEA-LIONS FIGHTING AT TOLSTOI.—Here was a sea-lion rookery, the outskirts of which I had trodden upon for the first time. These old males, surrounded by their meek, polygamous families, were impelled toward each other by those latent fires of hate and jealousy, which seemed to burst forth and fairly consume the angry rivals. Opening with a long, round, vocal prelude, they gradually came together, as the fur-seal bulls do, with averted heads, as though the sight of each other was sickening—but fight they must. One would play against the other for an unguarded moment in which to assume the initiative, until it had struck its fangs into the thick skin of its opponent's jowl; then, clenching its jaws, was not shaken off until the struggles of its tortured victim literally

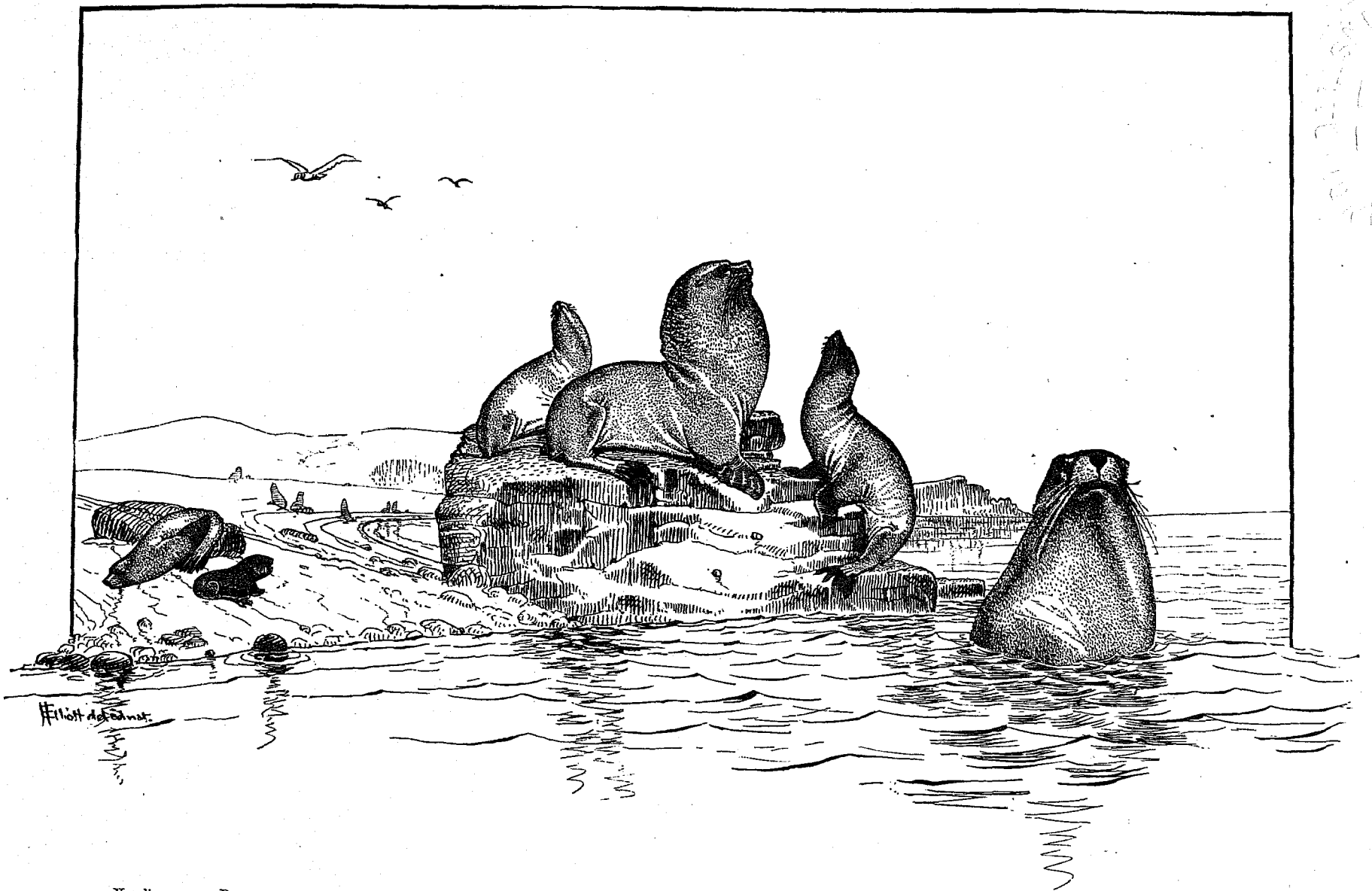
*The sea-lion certainly seems to have a more elastic constitution than is possessed by the fur-seal; in other words, the former can live under greater natural extremes of climate than can the latter. A careful test of this question was made by the late R. B. Woodward, in the aquaria of his famous gardens at San Francisco. He told me at the Grand Hotel, in 1873, that he should not attempt to keep another fur-seal alive in his tanks; that every one of the half dozen live specimens which he had placed therein at different intervals during the last three years had died—began to droop and waste away as soon as they were installed in their new quarters; but he seldom lost a sea-lion, except from clear or natural reasons. Mr. Woodward, from his practical experience, was positive in his belief that no living adult fur-seal could ever be exhibited in New York; while he thought that the sea-lion, both *Zalophus* and *Eumetopias*, could be carried alive, and in good condition, all over this country from New Orleans to Montreal, or San Francisco to Bangor. He said, "Our black sea-lion (*Zalophus*) is tougher than the larger kind (*Eumetopias*), and is just the creature for showmen."

†The teeth of the fur-seal are not, as a rule, clean and white, as they are in the mouths of most carnivora; they are badly discolored by black, brown, and yellowish coatings, especially so with regard to the males; the pup's milk teeth are complete exponents of the dental formula of adolescence, but are small, brittle, mostly black and brown in color; with their shedding, however, the permanent teeth come out quite clear, and glistening white; still, again, in a year or two they rapidly lose their purity of tint, being discolored as above stated. The sea-lion pups, also, are born with dingy, dusky milk teeth, but I found that when their permanent set was grown it usually retained, even into old age, its primitive whiteness. This difference between these animals is quite marked, which, together with the opposite characters of their blubber, mentioned hereafter, constitute a very curious basis of differentiation.

The fur-seal pup, when it spits or coughs in fright, opens its mouth wide, and the small black and brown teeth seem sadly out of place, set in the bright, rosy gums around the fresh pink tinge of the tongue and under the red, flushed palate.

The canines and incisors of *Callorhinus* and *Eumetopias* are well rooted, but the molars are not; their alveoli are only partly filled, so that when the fleshy gums are removed these teeth will easily rattle out of their sockets.

In looking over hundreds and thousands of the skulls of *Callorhinus* as they bleach out on the killing-grounds, I was struck by their astonishing lack of symmetry; they varied fully as much in their extremes as the skulls of many different genera do. The number of teeth differ also; some jaws have sets of but five molars, others six, and others seven.



Yearling. Pup. Old male's face.

THE SEA-LION.

(Eumetopias Stelleri: males and females.)

Life-studies by the author, Pribylov Islands. 1872–'76.

tore them out, leaving an ugly, gaping wound—for the sharp eye-teeth cut a deeper gutter in the skin and flesh than would have held my hand; fired into almost supernatural rage, the injured lion retaliated, quick as a flash, in kind; the hair flew from both of them into the air, the blood streamed down in frothy torrents, while high above the boom of the breaking waves and shrill deafening screams of water-fowl over head, rose the ferocious, hoarse, and desperate roar of the combatants.

LAND TRAVEL OF THE SEA-LION.—Though provided with flippers, to all external view, as the fur-seal is, the sea-lion cannot, however, make use of them at all in the same free manner. The fur-seal may be driven five or six miles in twenty-four hours, under the most favorable conditions of cool, moist weather; the "seevitchie", however, can only go two miles, the conditions of weather and roadway being the same. The sea-lion balances and swings its long and heavy neck, as a lever, to and fro, with every hitching up behind of its posterior limbs, which it seldom raises from the ground, drawing them up after the fore-feet with a slide over the grass or sand, and rocks, as the case may be; ever and anon pausing to take a sullen and savage survey of the field and the natives, who are driving them.

The sea-lion is polygamous, but it does not maintain any regular system and method in preparing for and attending to its harem, like that so finely illustrated on the breeding-grounds of the fur-seal; and it is not so numerous, comparatively speaking. There are not, according to my best judgment, over ten or twelve thousand of these animals altogether on the breeding-grounds of the Pribylov islands; it does not haul more than a few rods anywhere, or under any circumstances, back from the sea. It cannot be visited and inspected by men as the fur-seals are, for it is so shy and suspicious that, on the slightest warning of an approach, a stampede into the water is a certain result.*

PECULIAR COWARDICE OF THE SEA-LION.—That noteworthy, intelligent courage of the fur-seal, though it does not possess half the size nor one-quarter of the muscular strength of the sea-lion, is entirely wanting in the huge bulk and brain of the *Eumetopias*. A boy, with a rattle or a pop-gun, could stampede ten thousand sea-lion bulls, in the height of the breeding-season, to the water; and keep them there for the rest of the season.†

FIRST ARRIVALS.—The males come out and locate over the narrow belts of the rookery-grounds (sometimes as at St. Paul on the immediate sea-margin of the fur-seal breeding places), two or three weeks in advance of the females, which arrive later, *i. e.*, between the 1st to the 6th of June; and these females are never subjected to that intense, jealous supervision so characteristic of the fur-seal harem. The sea-lion bulls, however, fight savagely among themselves, and turn off from the breeding-ground all the younger and weaker males.

THE FEMALE SEA-LION.—The cow sea-lion is not quite half the size of the adult male; she will measure from eight to nine feet in length osteologically, with a weight of four or five hundred pounds; she has the same general cast of countenance and build of the bull; but, as she does not sustain any fasting period of over a week or ten days consecutively, she never comes out so grossly fat as the male. With reference to the weight of the latter, I was particularly unfortunate in not being able to get one of those big bulls to the scales before it had been bled; and in bleeding I know that a flood of blood poured out which should have been recorded in the weight. Therefore, I can only estimate this aggregate avoirdupois of one of the finest-conditioned adult male sea-lions at 1,400 to 1,500 pounds; an average weight, however, might safely be recorded as touching 1,200 pounds.‡

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* That the sea-lion bull should be so cowardly in the presence of man, yet so ferocious and brave toward one another and other amphibious animals, struck me as a line of singular contrast with the undaunted bearing of the fur-seal "seacatch", which, though being not half the size, or possessing muscular power to anything like its development in the "seevitchie", nevertheless, will unflinchingly face, on its station at the rookery, any man, to the death. The sea-lion bulls, certainly, fight as savagely and as desperately, one with another, as the fur-seal males do. There is no question about that; and their superior strength and size only makes the result more effective in the exhibition of gaping wounds and attendant bloodshed. I have repeatedly seen examples of these old warriors of the sea which were literally scarred, from their muzzles to their posteriors, so badly and so uniformly as to have fairly lost all the color, or general appearance even, of hair anywhere on their bodies.

I recall, in this connection, the sight of an aged male sea-lion, which had evidently been defeated by a younger and more lusty rival, perhaps; it was hauled upon a lava shelf at Southwest point, solitary and alone; the rock around it being literally covered with pools of pus, which was oozing out and trickling down from a score of festering wounds; the victim stood planted squarely on its torn fore-flippers, with head erect and thrown back upon its shoulders; its eyes were closed, and it gently swayed its sore neck and shoulders in a sort of troubled, painful day-dreaming or dozing. Like the fur-seal, the sea-lion never notices its wounds to nurse and lick them, as dogs do, or other carnivora; it never pays the slightest attention to them, no matter how grievously it may be injured.

† This marked cowardice of the sea-lion was well noted by Steller, who speaks of it thus: "Though the males have a terrible aspect, yet they take flight on the first appearance of man; and if surprised in their sleep, they are panic struck, sighing deeply, and in their attempt to escape get quite confused, tumble down, and tremble so much that they are scarcely able to move their limbs. If, however, reduced to extremity, they grow desperate, turn on their enemy with great fury and noise, and put even the most valiant to flight."—*Nov. Com. Acad. Sci. Petropol.*, tome ii, 1749.

‡ Often, when the fur-seal and sea-lion bulls haul up in the beginning of the season, examples among them which are inordinately fat will be seen; their extra avoirdupois renders them very conspicuous, even among large gatherings of their kind; they seem to exhibit a sense of self-oppression then, quite as marked as is that subsequent air of depression worn when, later, they have starved out this load of surplus blubber, and are shambling back to the sea, for recuperation and rest.

I thought over and devised many plans to kill and weigh entire one of these unusually heavy bulls; but, they all failed, because I did not have the time to spare from so many other observations pressing and necessary to be made at that season, if made at all during the year. The united effort of five or six men, aided by the mule and cart at St. Paul, would solve the problem, doubtless, almost any day they set about

ORGANIZATION OF SEA-LION ROOKERIES.—The sea-lion rookery will be found to consist of about ten to fifteen females to every male. The females, in landing, seem to be influenced by no preference for one male above another, but are actuated solely to come ashore at a suitable place, where, soon after landing, they are to bring forth their young. The cow seems at all times to have the utmost freedom in moving from place to place; and also often to start with its young—which is noteworthy, inasmuch as I never saw it among the fur-seals—picking the pup up by the nape and carrying it to the water to play with it for short spells in the surf wash. The pup sea-lions are by no means helpless when they are born; when they first come into the world their eyes are promptly opened wide and clear; they stand up quite free and strong on their odd flipper-feet, and commence at once, in their frequent intervals of wakefulness, to crawl over bowlders and the sand, to paddle in the surf, and to roar huskily and shrilly at their parents.

GROWTH OF YOUNG SEA-LIONS.—They are fed upon the richest of rich milk, at irregular and somewhat lengthy periods; regaled in this manner, the young sea-lion grows with surprising rapidity, so much so that its weight, of 9 or 12 pounds at birth, is increased to 75 or 90, in less than four months thereafter. By this time, also, it has shed its natal coat and teeth; it has grown a strong mustache, and has become a facile swimmer and expert fisherman, though at first it was one of the most clumsy, yet never so helpless as the fur-seal. The liquid, pearly-blue eye of the little fellow is soon changed into the sinister expression of adolescence, when it has rounded its second year. It appears to grow up unnoticed by its grim-looking parents, though the maternal attention is more evident, but still scant, indeed, when contrasted with the love evinced by cat or dog for its offspring.

VISITING THE TOLSTOI ROOKERY.—At the east end of St. George island, just to the southward of Tolstoi Mees, is one of the finest sea-lion rookeries on the islands, or, perhaps, in the world. It lies at the base of a frowning wall of precipitous cliffs, the mural walls sheer aloft 400 and 500 feet as they overhang the sea. Here beneath, on a rocky stretch of beach some 30 or 40 feet wide, at high-water mark, stowed thickly side by side, end to end, and crosswise for a distance of half a mile up and down the coast, are four or five thousand sea-lions of all sizes and both sexes; and here they will be found every summer, secure from the approach of enemies by land. Inasmuch as they rest there under the cliffs, they cannot be practically approached and driven, as their kind are by the Aleuts, from their more accessible breeding-haunts at Northeast point, St. Paul island.*

By paying attention to the direction of the wind, the observer can descend at intervals from the heights above, unheeded and unsuspected by them, to within a stone's throw of their tawny forms; where you may notice their thousand and one unconstrained and peculiar maneuvers, which would be interrupted at once by a tumultuous and universal rush for the water should you make yourself known. You will be impressed, first, by their excessive restlessness; they are ever twisting and turning, coiling and uncoiling themselves over the rocks; now stretched out prone in slumber, the next minute up and moving. The roar of one is instantly caught up by another, so that the aggregate sound, as it rises and falls from this rookery, reverberating along the bluffs at irregular though close intervals, can only be compared, in my mind, to the hoarse sound of a tempest as it howls through the rigging of a ship, or sighs through the branches of a forest growth.

The voice of the northern sea-lion, *Eumetopias*, is confined to either a deep, resonant roar, or a low, muttering growl; not only to the males alone is this monotone peculiar, but also to the females and the young. It does not have that striking flexibility of the *Callorhinus*, and in this respect their vocal organization is very marked and different from that of the fur-seal. I might say, further, that the pups are exceedingly playful, but, unlike the noisy "kotickie", they are almost silent; when they utter a sound it is a short, sharp, querulous growling.

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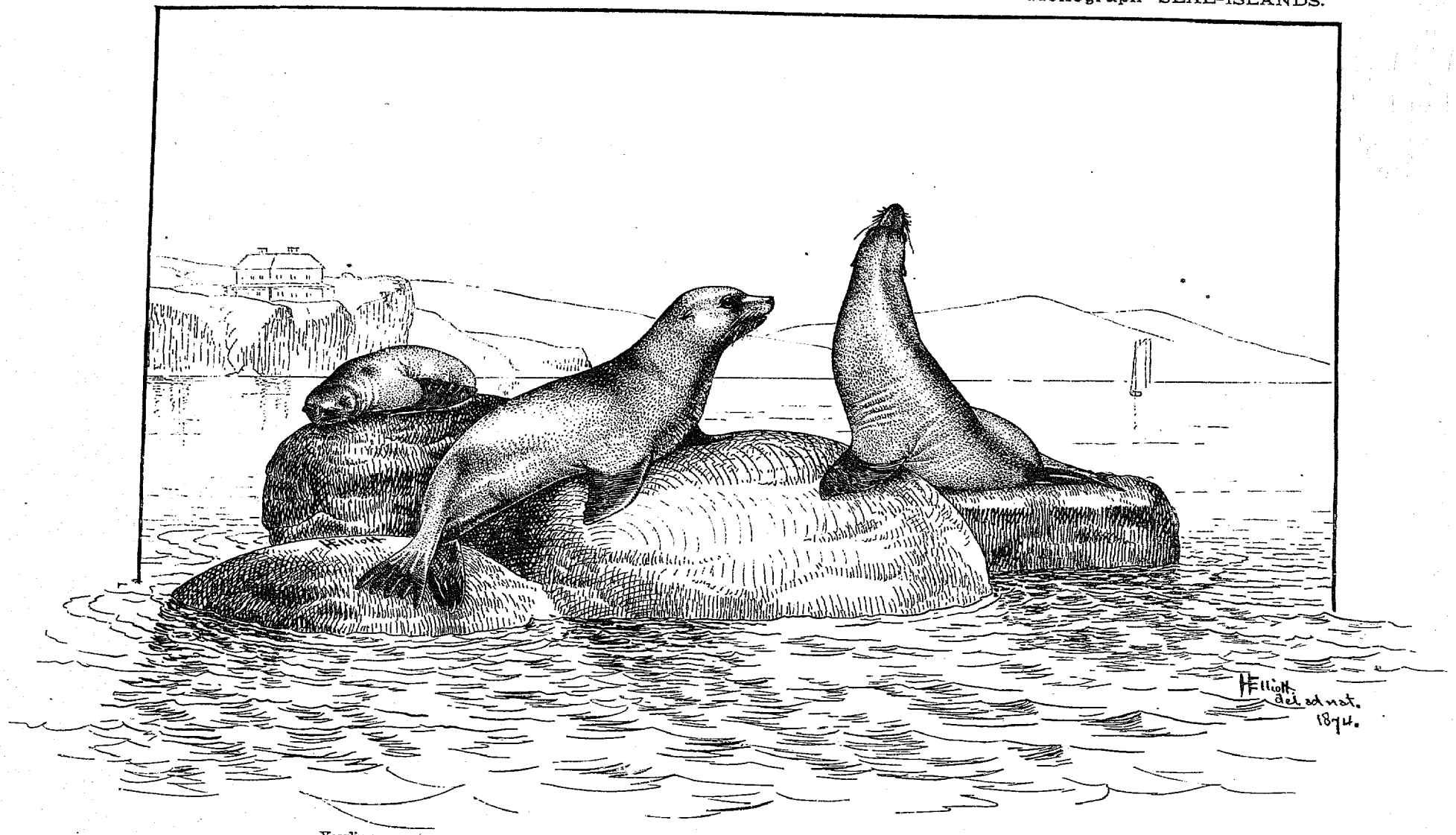
it, early in May. Some of these super-fleshy fur-seal males look as though they were from 600 to 700 pounds weight, while I have seen several sea-lion bulls that actually appeared equal to turning the scales at 1,500 pounds avoirdupois. These fur-seals which I did weigh in July, 1873, and September, 1872, were not at all extra fleshy, and consequently do not give a fair return for these examples above referred to.

*It will be noticed that I have made no especial spacing or reservation on my maps for the sea-lions at Northeast point, on St. Paul island, but have included them solidly within the lines of the breeding fur-seals. The reason why I omit these lines of exact limitation is due to the fact that they laid in, along the water's edge at intervals, so closely with the fur-seals, and in such apparent good fellowship, that I could not observe any sharp demarkation between them; except only the irregular, confused patches of their bright golden coats in contrast with the dull rusty dress of *Callorhinus*. The *Eumetopias*, here, where it was breeding, never lay far back from the surf, but always close to its high-water washings; in this method, I should judge, about 12,000 to 15,000 of them occupy little strips of Novastoshnah and Seevitchie Kammin; being the only rookery spots on the Pribylov islands where they breed in close juxtaposition with the fur-seals. Then, there is a sea-lion rookery on St. George, all to itself, under the high mural walls just north of the Garden cove sand beech, where I estimate another 4,000 to 5,000 of these animals annually haul out and breed. Very likely my allowance of 12,000 to 15,000 sea-lions on St. Paul is too large, and 10,000 is a better figure of their numerical expression. My published estimates of 25,000 on the two islands, in 1874, I feel now are larger than the facts allow.

As might be inferred, the sea-lions at Novastoshnah do not allow the fur-seals to disturb them, nor do they in turn ever appear to annoy or drive their physically weaker brethren; they seem to wear an air of perfect unconcern for each other; although the fur-seal bulls, I observed, were never caught lounging over the narrow littoral margins of the sea-lions' breeding-grounds; but meekly bowed their heads and scuttled across, wholly beneath the notice of the huge "seevitchie".

Why the sea-lion should be relatively so scant in numbers over the great extent of the large geographical area wherein it is found, is perplexing to me, for, it is physically as active and much more powerful than the fur-seal; perhaps, this increased bulk of body deters it from feeding as successfully as its more lithesome cousin does. I should estimate that the full-grown sea-lion bull, after it leaves the islands at the end of the breeding-season, until it reappears for the next, would require at least 100 pounds of fish per diem, while the females and younger males would crave and consume from 40 to 60 pounds of such food every twenty-four hours.



Yearling.

Female.

THE BLACK SEA-LION.

(Zalophus Gillespii.)

The author's life-studies of a four-year-old male, an adult female, and a yearling, at San Francisco, Cal. (Woodward's Gardens).

THE YOUNG PROMPTLY DESERTED.—You will notice that if you disturb and drive off any portion of the rookery, by walking up in plain sight, those nearest to you will take to the water, instantly swim out to a distance of fifty yards or so, leaving their pups behind, helplessly sprawled around and about the rocks at your feet. Huddled up all together in the water in two or three packs or squads, the startled parents hold their heads and necks high out of the sea, peering keenly at you, and all roaring in an incessant concert, making an orchestra to which those deep sonorous tones of the organ in that great Mormon tabernacle, at Salt Lake City, constitute the fittest and most adequate resemblance.

MOVEMENTS WHEN UNDISTURBED ON ROOKERY.—You will witness an endless tide of these animals traveling to the water, and a steady stream of their kind coming out, if you but keep in retirement and do not disturb them. When they first issue from the surf they are a dark chocolate-brown and black, and glisten; but, as their coats dry off, the color becomes an iron-gray, passing into a bright golden rufous, which covers the entire body alike—shades of darker brown on the pectoral patches and sterno-pectoral region. After getting entirely dry, they seem to grow exceedingly uneasy, and act as though oppressed by heat, until they plunge back into the sea, never staying out, as the fur-seal does, day after day and week after week. The females and the young males frolic in and out of the water, over rocks awash, incessantly one with another, just as puppies play upon the green sward; and, when weary, stretch themselves out in any attitude that will fit the character of the rock, or the lava-shingle upon which they may happen to be resting; the movements of their supple spines, and ball-and-socket joint attachments, permit of the most extraordinary contortions of the trunk and limbs, all of which, no matter how distressing to your eyes, they seem actually to relish. But, the old battle-scarred bulls of the harem stand or lie at their positions day and night without leaving them, except to take a short bath when the coast is clear, until the end of the season.

METHOD OF SWIMMING.—When swimming, the sea-lion only lifts its head above the surface long enough to take a deep breath, and then drops down a few feet below, and propels itself, for about ten or fifteen minutes, like a cigar-steamer, at the rate of 6 or 7 knots, if undisturbed; but, if chased or alarmed, it seems fairly to fly under water, and can easily maintain for a long time a speed of 14 or 15 miles per hour. Like the fur-seal, its propulsion through the water is the work entirely of the powerful fore-flippers, which are simultaneously struck out, both together, and back against the water, feathering forward again to repeat, while the hind-flippers are simply used as a rudder oar in deflecting the ever-varying swift and abrupt course of the animal. On land the hind-flippers are employed just as a dog does his feet in scratching fleas—the long peculiar toe-nails thereof seeming to reach and comb the spots affected by vermin, which annoys them, as it does the fur-seal to a great extent, and causes them both to enjoy a protracted scratching.

Again, both genera, *Callorhinus* and *Eumetopias*, are happiest when the surf is strongest and wildest; just in proportion to the fury of a gale, so much the greater joy and animation of these animals. They delight in riding on the crests of each dissolving breaker up to the moment when it fairly foams over the iron-bound rocks; at that instant they disappear like phantoms beneath the creamy surge to reappear on the crown of the next mighty billow.

When landing, they always ride on the surf, so to speak, to the objective point, and it is marvelous to see with what remarkable agility they will worm themselves up steep, rocky landings, having an inclination greater than 45°, to those bluff tops above, which have an almost perpendicular drop to water.

THE VALUE OF THE SEA-LION, COMMERCIALLY: SHEDDING.—As the sea-lion is without fur, its skin has little or no commercial value.* The hair is short, an inch to an inch and a half in length, being longest over the nape of the neck; straight, and somewhat coarse, varying in color as the season comes and goes. For instance, when the *Eumetopias* makes its first appearance in the spring and dries out after landing, it has then a light brownish rufous-tint, with darker shades back and under the fore flippers and on the abdomen; by the expiration of a month or six weeks, about the 15th of June generally, this coat will then be weathered into a glossy rufous, or ocher; and this is soon before shedding, which sets in by the middle of August, or a little earlier. After the new coat has fairly grown, and just before the animal leaves the island for the sea in November, it is a light sepia or vandyke brown, with deeper shades, almost black, upon the abdomen. The cows after shedding never color up so darkly as the bulls; but when they come back to the land next year they return identically the same in tinting; so that the eye, in glancing over a sea-lion rookery during June and July, cannot discern any dissimilarity in color, at all noteworthy, existing between the coats of the bulls and the cows; and also the young males and yearlings appear in the same golden-brown and ocher, with here and there an animal which is noted as being spotted somewhat like a leopard, the yellow rufous-ground predominating, with patches of dark-brown, blotched, and mottled irregularly

*The sea-lion and hair-seals of Bering sea, having no commercial value in the eyes of civilized men, have not been subjects of interest enough to the pioneers of those waters for mention in particular; such record, for instance, as that given of the walrus, the sea-otter, and the fur-seal. Steller was the first to draw the line clearly between them and seals in general, especially defining their separation from the fur-seal; still, his description is far from being definite or satisfactory in the light of our present knowledge of the animal.

In the South Pacific and Atlantic the sea-lion has been curiously confounded by many of the earliest writers with the sea-elephant, *Macrorhinus leoninus*, and its reference is inextricably entangled with the fur-seal at the Falklands, Kerguelen's Land, and the Crozettes. The proboscidean seal, however, seems to be the only pinniped which visits the Antarctic continent; but that is a mere inference of mine, because so little is known of those ice-bound coasts, and Wilkes, who gives the only record made of the subject, saw no other animal there save this one.

interspersed over the anterior regions down to those posterior. I have never seen any of the old bulls or cows thus mottled, and this is likely due to some irregularity of shedding in the younger animals; for I have not noticed it early in the season, and it seems to fairly fade away so as not to be discerned on the same animal at the close of its summer solstice. Many of the old bulls have a grizzled or "salt and pepper" look during the shedding period, which is from the 10th of August up to the 10th or 20th of November. The pups, when born, are a rich dark-chestnut brown; this coat they shed in October, and take one much lighter in its stead; still darker, however, than their parents.

ARRIVAL AT AND DEPARTURE FROM THE PRIBYLOV ISLANDS.—The time of arrival at, stay on, and departure from, the islands, is about the same as that which I have recorded as characteristic of the fur-seal; but, if the winter is an open, mild one, some of the sea-lions will frequently be seen about the shores during the whole year; and then the natives occasionally shoot them, long after the fur-seals have entirely disappeared.

GREAT RANGE OF SEA-LION: IT IS NOT RESTRICTED TO THE SEAL-ISLANDS.—Again, it does not confine its landing to the Pribylov islands alone, as the fur-seal unquestionably does, with reference to such terrestrial location in our own country. On the contrary, it is a frequent visitor to almost all of the Aleutian islands, and ranges, as I have said before, over the mainland coast of Alaska, south of Bristol bay, and about the Siberian shores to the westward, throughout the Kuriles and the Japanese northern waters.*

DIFFERENCES BETWEEN ZALOPHUS AND EUMETOPIAS.—When I first returned, in 1873, from the seal-islands, those authors, whose conclusions were accepted prior to my studies there, had agreed in declaring that the sea-lion, so common off the port of San Francisco, was the same animal also common in Alaska, and the Pribylov islands in especial; but my drawings from life, and studies, quickly pointed out the error, for it was seen that the creature most familiar to the Californians was an entirely different animal from my subject of study on the seal-islands. In other words, while scattered examples of the *Eumetopias* were, and are, unquestionably about and off the harbor of San Francisco, yet nine-tenths of the sea-lions there observed were a different animal—they were the *Zalophus Californianus*. This *Zalophus* is not much more than half the size of *Eumetopias*, relatively; it has the large, round, soft eye of the fur-seal, and the more attenuated Newfoundland-dog-like muzzle; and it never roars, but breaks out incessantly with a *honk, honk, honking* bark, or howl.

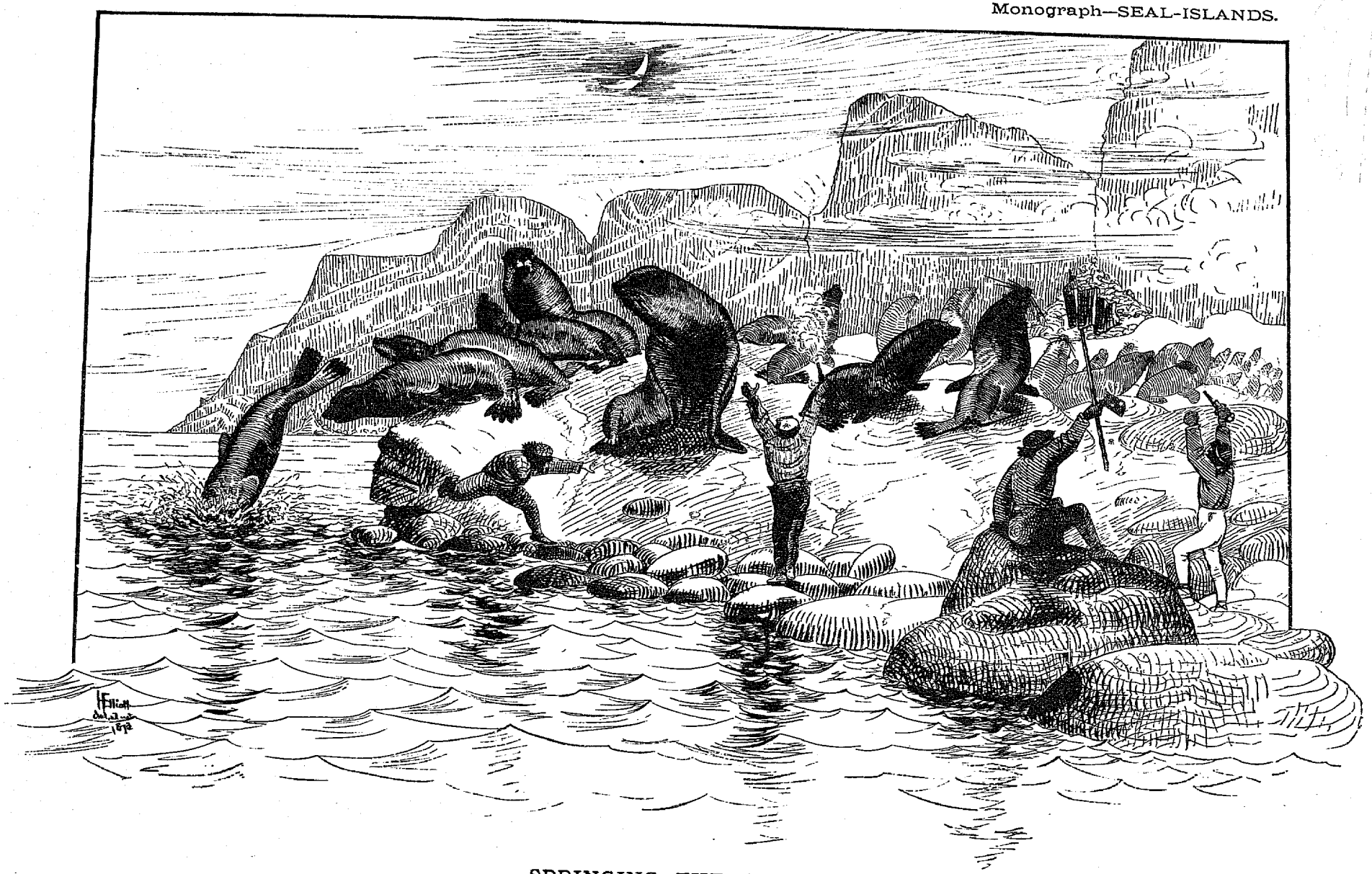
No example of *Zalophus* has ever been observed in the waters of Bering sea, nor do I believe that it goes northward of Cape Flattery.

EARLY DISPOSITION OF SEA-LIONS ON ST. GEORGE.—According to the natives of St. George, some fifty or sixty years ago the *Eumetopias* held almost exclusive possession of the island, being there in great numbers, some two or three hundred thousand strong; and they aver, also, that the fur-seals then were barely permitted to land by these animals, and in no great number; therefore, they say, that they were directed by the Russians (that is, their ancestry) to hunt and worry the sea-lions off from the island, the result being that, as the sea-lions left, the fur-seals came, so that to-day they occupy nearly the same ground which the *Eumetopias* alone covered sixty years ago. I call attention to this statement of the people because it is, or seems to be, corroborated in the notes of a French naturalist and traveler, who, in his description of the island of St. George, which he visited fifty years ago, makes substantially the same representation;† but directly to the contrary, and showing how difficult it is to trace these faint records of the facts, I give the account as rendered by Bishop Veniaminov, which I translate and place in my appendix. The reader will notice that the Russian author differs entirely from the natives and the Frenchman; for, by his tabulation, almost as many fur-seals were taken on St. George during the first years of occupation as were taken from St. Paul; and according to these figures, again continued, the

* The winter of 1872–'73, which I passed on the Pribylov islands, was so rigorous that the shores were ice-bound and the sea covered with floes from January until the 28th of May; hence, I did not have an opportunity of seeing, for myself, whether the sea-lion remains about its breeding-grounds there throughout that period. The natives say that a few of them, when the sea is open, are always to be found, at any day during the winter and early spring, hauled out at Northeast point, on Otter island, and around St. George. They are, in my opinion, correct; and, being in such small numbers, the "seevitchie" undoubtedly find enough subsistence in local crustacea, pisces, and other food. The natives, also, further stated that none of the sea-lions which we observe on the islands during the breeding-season leave the waters of Bering sea from the date of their birth to the time of their death. I am also inclined to agree with this proposition, as a general rule, though it would be strange if Pribylov sea-lions did not occasionally slip into the North Pacific, through and below the Aleutian chain, a short distance, even to traveling as far to the eastward as Cook's inlet. *Eumetopias Stelleri* is well known to breed at many places between Attoo and Kadiak islands. I did not see it at St. Matthew, however, and I do not think it has ever bred there, although this island is only 200 miles away to the northward of the seal-islands—too many polar bears. Whalers speak of having shot it in the ice-packs in a much higher latitude, nevertheless, than that of St. Matthew. I can find no record of its breeding anywhere on the islands or mainland coast of Alaska north of the 57th parallel or south of the 53d parallel of north latitude. It is common on the coast of Kamtchatka, the Kurile islands, and the Commander group, in Russian waters.

There are vague and ill-digested rumors of finding *Eumetopias* on the shores of Prince of Wales and Queen Charlotte islands in breeding-rookeries; I doubt it. If it were so, it would be authoritatively known by this time. We do find it in small numbers on the Farralone rocks, off the entrance to the harbor of San Francisco, where it breeds in company with, though sexually apart from, an overwhelming majority of *Zalophus;* and it is creditably reported as breeding again to the southward, on the Santa Barbara, Guadaloupe, and other islands of southern and Lower California, consorting there, as on the Farralones, with an infinitely larger number of the lesser-bodied *Zalophus.*

† Choris: *Voyage Pittoresque autour du Monde.*



SPRINGING THE ALARM.

Natives capturing Sea-lions (Eumetopias Stelleri), Pribylov Islands.

catch never has been less than one-sixth of the number of the quota on the larger island. Thus the two authors seem to stand each other off, and I am thrown back to the ground itself for an answer, which I am inclined to believe will be correct, when I say that the island of St. George never was resorted to in any great numbers by the fur-seal, and that the sea-lion was the dominant animal there until disturbed and driven from its breeding-grounds by the people, who naturally sought to encourage its more valuable relative by so doing, and made room, in this way, for it.

16. CAPTURE OF THE SEA-LION.

THE DRIVING ON ST. PAUL.—The great intrinsic value to the domestic service of the Aleuts rendered by the flesh, fat, and sinews of this animal, together with its skin, arouses the natives of St. Paul and St. George, who annually make a drive of "seevitchie", by which they capture, on the former island, two or three hundred, as the case may be. On St. George, driving is so much more difficult, owing to the character of the land itself, that very few are secured there; but, at St. Paul unexceptional advantages are found on Northeast point for the capture of these shy and wary brutes. The natives of St. Paul, therefore, are depended upon to secure the necessary number of skins required by both islands for their boats, and other purposes. This capture of the sea-lion is the only serious business which the people have on St. Paul; it is a labor of great care, industry, and some physical risk for the Aleutian hunters.*

By reference to my sketch-map of Northeast point rookery, the observer will notice a peculiar neck or boot-shaped point, which I have designated as Sea Lion neck. This area is a spot upon which a large number of sea-lions are always to be found during the season. As they are so shy, and sure to take to water upon the appearance or presence of man near by, the natives adopt this plan:

PREPARATIONS FOR THE DRIVE.—Along by the middle or end of September, as late sometimes as November, and after the fur-seal rookeries have broken up for the season, fifteen or twenty of the very best men in the village are selected, by one of their chiefs, for a sea-lion rendezvous at Northeast point; they go up there with their provisions, tea and sugar, and blankets, and make themselves at home in the *barrabbora* and houses, which I have located on the sketch-map of Novastoshnah, prepared to stay, if necessary, a month, or until they shall get the whole drove together of two or three hundred sea-lions.

METHODS OF DRIVING SEA-LIONS.—The "seevitchie", as the natives call these animals, cannot be approached successfully by daylight, so these hunters lie by, in this house of Webster's, until a favorable night comes along—one in which the moon is partially obscured by drifting clouds, and the wind blows over them from the rookery where the sea-lions lie; such an opportunity being afforded, they step down to the beach at low water, and proceed to creep on all-fours over the surf-beaten sand and bowlders up to the dozing herd, and between it and the high-water mark where it rests. In this way, a small body of natives, crawling along in Indian file, may pass unnoticed by the sea-lion sentries, which doubtless, in the uncertain light see, but confound, the forms of their human enemies with those of seals. When the creeping Aleuts have all reached the strip of beach that is left bare by ebb-tide, which is between the water and the unsuspecting animals, at a given signal from their crawling leader they all at once leap to their feet, shout, yell, brandishing their arms, and firing off pistols, while the astonished and terrified lions roar and flounder in all directions.

BEHAVIOR OF THE SEA-LIONS WHEN SURPRISED.—If, at the moment of surprise, the brutes are sleeping with their heads pointed toward the water, they rise up in fright and charge straight on in that way directly over the men themselves, but if their heads have been resting at this instant pointed landward, up they rise and follow that course just as desperately, and nothing will turn them either one way or the other; those sea-lions which charged for the water are lost, of course;† but the natives promptly follow up the land-turned animal with a rare

* A curious, though doubtless authentic, story was told me, in this connection, illustrative of the strength and energy of the sea-lion bull when at bay. Many years ago (1847), on St. Paul island, a drive of September sea-lions was brought down to the village in the usual style; but when the natives assembled to kill them, on account of the great scarcity, at that time, of powder on the island, it was voted best to lance the old males also, as well as the females, rather than shoot them in the customary style. The people had hardly set to work at the task when one of their number, a small, elderly, though tough, able-bodied Aleut, while thrusting his lance into the "life" of a large bull, was suddenly seen to fall on his back, directly under the huge brute's head; instantly the powerful jaws of the "seevitchie" closed upon the waistband, apparently, of the native, and, lifting the yelling man aloft, as a cat would a kitten, the sea-lion shook and threw him high into the air, away over the heads of his associates, who rushed up to the rescue, and quickly destroyed the animal by a dozen furious spear-thrusts, yet death did not loosen its clenched jaws, in which were the tattered fragments of Ivan's clothing.

†The natives appreciate this peculiarity of the sea-lion very keenly, for good and sufficient cause, though none of them have ever been badly injured in driving, or "springing the alarm". I camped with them for six successive nights in September, 1872, in order to witness the whole procedure. During the several drives made while I was with them, I saw but one exciting incident; everything went off in the orthodox manner, as described in the text above. The exceptional incident occurred during the first drive of the first night, and rendered the natives so cautious that it was not repeated. When the alarm was sprung, old Luka Mandrigan was leading the van, and at that moment, down upon him, despite his wildly gesticulating arms and vociferous yelling, came a squad of bull "seevitchie". The native saw instantly that they were pointed for the water, and, in his sound sense, turned to run from under, his tarbosar slipped upon a slimy rock awash, he fell flat as a flounder, just as a dozen or more big sea-lions plunged over and on to his prostrate form in the shallow water. In less time than this can be written, the heavy pinnipeds had disappeared, while the bullet-like head of old Luka was quickly raised, and he trotted back to us with an alternation of mirth and chagrin in his voice; he was not hurt in the least.

combination of horrible noises and demoniacal gesticulations, until the first frenzied spurt and exertions of the terrified creatures so completely exhaust them that they fall panting, gasping, prone upon the earth, extended in spite of their huge bulk and powerful muscles, helpless, and at the mercy of their cunning captors; who, however, instead of slaying them as they lie, rudely rouse them up again, and urge the herd along to the house, in which they have been keeping this watch during the several days past.

THE "CORRAL".—Here, at this point, is a curious stage in the proceedings. The natives drive up to that "Webster's" house the 25 or 30 or 40 sea-lions, as the case may be, which they have just captured—they seldom get more at any one time—and keep them in a corral or pen right by the barrabbora, on the flattened surface of a sand-ridge, in the following comical manner: when they have huddled up the "pod", they thrust stakes down around it at intervals of 10 to 30 feet, to which strips of cotton cloth are fluttering as flags, and a line or two of sinew-rope, or thong of hide, is strung from pole to pole around the group, making a circular cage, as it were; within this flimsy circuit the stupid sea-lions are securely imprisoned; and though they are incessantly watched by two or three men, the whole period of caging and penning which I observed, extending over nine or ten days and nights, passed without a single effort being made by the "seevitchie" to break out of their flimsy bonds; and it was passed by these animals not in stupid quiescence, but in alert watchfulness; writhing, twisting, turning one upon and over the other.

By this method of procedure, after the lapse usually of two or three weeks, a succession of favorable nights will have occurred; and the natives secure their full quota, which, as I have said before, is expressed by a herd of two or three hundred of these animals.

PREPARATION AND METHOD OF DRIVING TO THE VILLAGE.—The complement filled, the natives prepare to drive their herd back to the village, over the grassy and mossy uplands and intervening stretches of sand-dune tracts, fully eleven miles, preferring to take the trouble of prodding the clumsy brutes, wayward and obstinate as they are, rather than to pack their heavy hides in and out of boats; making, in this way, each sea-lion carry its own skin and blubber down to the doors of their houses in the village. If the weather is normally wet and cold, this drive, or caravan of sea-lions, can be driven to the point of destination in five or six days; but, should it be dry and warmer than usual, three weeks, and even longer, will elapse before the circuit is traversed.

When the drive is started the natives gather around the herd on all sides, save the opening which they leave pointing to the direction in which they desire the animals to travel; and, in this manner they escort and urge the "seevitchie" on to their final resting and slaughter near the village. The young lions and the females being much lighter than the males, less laden with fat or blubber, take the lead; for they travel twice and thrice as easy and as fast as the old males; which, by reason of their immense avoirdupois, are incapable of moving ahead more than a few rods at a time, when they are completely checked by sheer loss of breath, though the vanguard of the females allures them strongly on; but, when an old sea-lion feels his wind coming short, he is sure to stop, sullenly and surlily turning upon the drivers, not to move again until his lungs are clear.

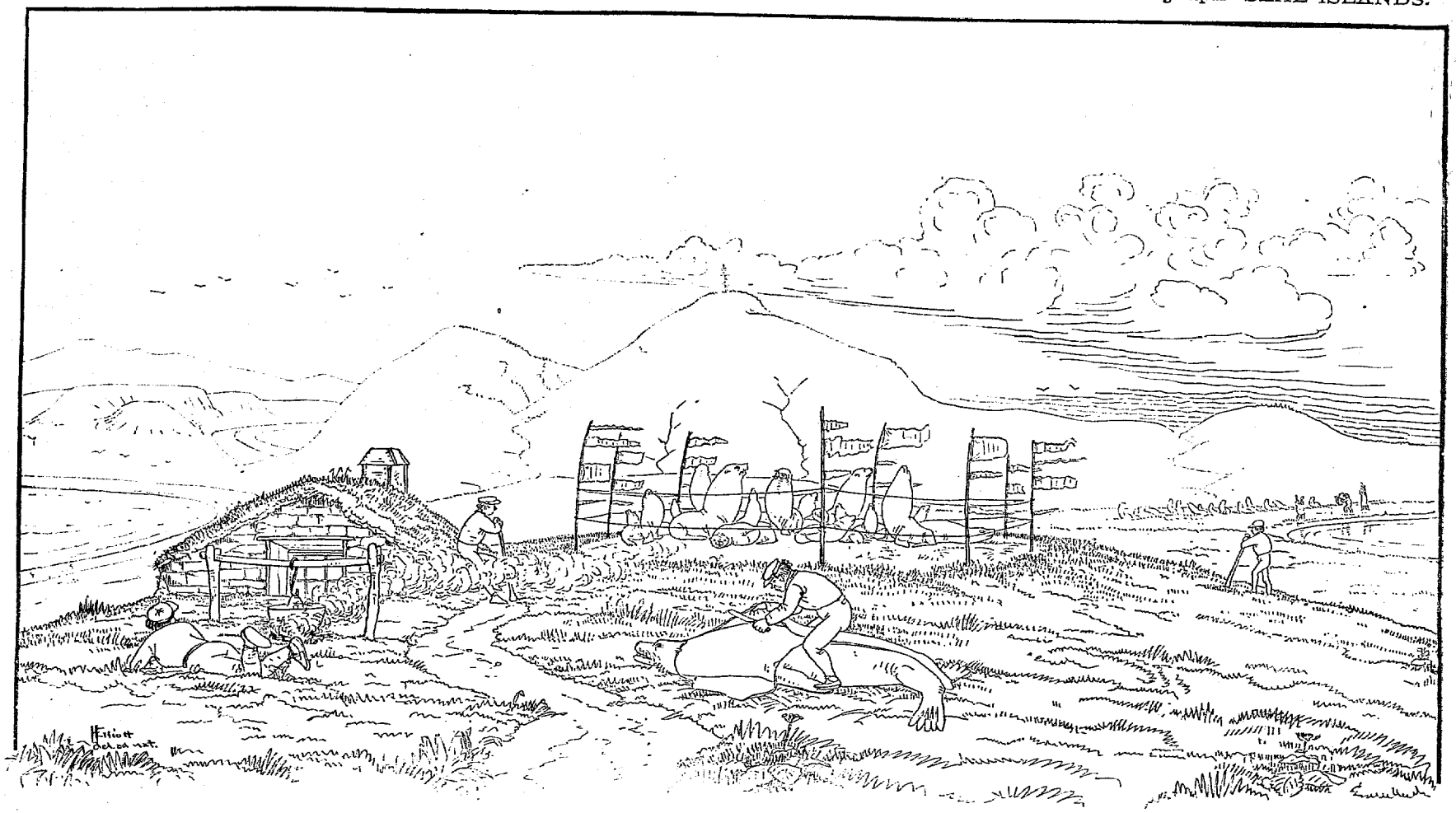
In this method and manner of conduction the natives stretch the herd out in extended file, or, as a caravan, over the line of march, and, as the old bulls pause to savagely survey the field and catch their breath, showing their wicked teeth, the drivers have to exercise every art and all their ingenuity in arousing them to fresh efforts. This they do by clapping boards and bones together, firing fusees, and waving flags; and, of late, and best of all, the blue gingham umbrella repeatedly opened and closed in the face of an old bull has been a more effective starter than all the other known artifices or savage expedients of the natives.*

* The curious behavior of the sea-lions in the Big lake, when they are *en route* and driven from Novastoshnah to the village, deserves mention. After the drove gets over the sand-dunes and beach between Webster's house and the extreme northeastern head of the lake, a halt is called and the drove "penned" on the bank there; then, when the sea-lions are well rested, they are started up, and pell-mell into the water; two natives, in a bidarka, keep them from turning out from shore into the broad bosom of Meesulkmahnee, while another bidarka paddles in their rear and follows their swift passage right down the eastern shore; in this method of procedure, the drive carries itself nearly two miles by water in less than twenty minutes from the time the sea-lions are first turned in, at the north end, to the moment when they are driven out at the southeastern elbow of the Big pond. The shallowness of the water here accounts probably for the strange failure of the sea-lions to regain their liberty, and so retards their swimming as to enable the bidarka, with two men, to keep abreast of their leaders easily, as they plunge ahead; and, "as one goes, so go all sheep," it is not necessary to pay attention to those which straggle behind in the wake; they are stirred up by the second bidarka, and none make the least attempt to diverge from the track which the swifter mark out in advance; if they did, they could escape "scot-free" in any one of the twenty minutes of this aquatic passage.

By consulting the map of St. Paul, it will be observed that in a direct line between the village and Northeast point there are quite a number of small lakes, including this large one of Meesulkmahnee; into all of these ponds the sea-lion drove is successively driven; this interposition of fresh water at such frequent intervals serves to shorten the time of the journey fully ten days in warmish weather, and at least four or five under the best of climatic conditions.

This track between Webster's house and the village killing-grounds is strewn with the bones of *Eumetopias*. They will drop in their tracks, now and then, even when carefully driven, from cerebral or spinal congestion principally; and when they are hurried the mortality *en route* is very great. The natives when driving them, keep them going day and night alike, but give them frequent resting spells after every spurt ahead. The old bulls flounder along for a hundred yards or so, then sullenly halt to regain breath, five or ten minutes being allowed them, then they are stirred up again, and so on, hour after hour, until the tedious transit is completed.

The younger sea-lions, and the cows which are in the drove, carry themselves easily far ahead of the bulls, and being thus always in the van, serve unconsciously to stimulate and coax the heavy males to travel. Otherwise, I do not believe that a band of old bulls, exclusively, could be driven down over this long road successfully.



THE SEA-LION PEN.

Natives corralling Sea-lions at the Barrabora near Webster's House, under Cross Hill, Northeast Point, St. Paul Island.

ARRIVAL OF THE DRIVE AT THE VILLAGE.—The procession of sea-lions managed in this strange manner day and night—for the natives never let up—is finally brought to rest within a stone's throw of the village, which has pleasurably anticipated, for days, and for weeks, its arrival, and rejoices in its appearance. The men get out their old rifles and large sea-lion lances, and sharpen their knives, while the women look well to their oil-pouches, and repair to the field of slaughter with meat-baskets on their heads.

MANNER IN WHICH THE KILLING IS CONDUCTED.—No attempt is made, even by the boldest Aleut, to destroy an old bull sea-lion by spearing the enraged and powerful beast, which, now familiar with man and conscious as it were of his puny strength, would seize the lance between its jaws and shake it from the hands of the stoutest one in a moment. Recourse is had to the rifle. The herd is started up the sloping flanks of the Black Bluff hillside; the females speedily take the front, while the old males hang behind. Then the marksmen, walking up to within a few paces of each animal, deliberately draw their sights upon their heads and shoot them just between the eye and the ear. The old males thus destroyed, the cows and females are in turn surrounded by the natives, who, dropping their rifles, thrust the heavy iron lances into their trembling bodies at a point behind the fore-flippers, touching the heart with a single lunge. It is an unparalleled spectacle, dreadfully cruel and bloody.*

17. ECONOMIC USES OF THE SEA-LION.

HIGH APPRECIATION OF THE SEA-LION BY THE ALEUTS.—Although the sea-lion has little or no commercial value for us, yet to the service of the natives themselves, who live all along the Bering sea coast of Alaska, Kamtchatka, and the Kuriles, it is invaluable; they set great store by it. It supplies them with its hide, moustaches, flesh, fat, sinews, and intestines, which they make up into as many necessary garments, dishes, etc. They have abundant reason to treasure its skin highly, for it is the covering to their neat *bidarkies* and *bidarrahs*, the former being the small *kyak* of Bering sea, while the latter is a boat of all work, exploration, and transportation. These skins are unhaired by sweating in a pile; then they are deftly sewed and carefully stretched over a light keel and frame of wood, making a perfectly water-tight boat that will stand, uninjured, the softening influence of water for a day or two at a time, if properly air-dried and oiled. After being used during the day, these skin boats are always drawn out on the beach, turned bottom-side up and air-dried during the night; in this way made ready for employment again on the morrow.†

VALUE OF THE INTESTINES.—A peculiar value is attached to the intestines of the sea-lion, which, after skinning, are distended with air and allowed to dry in that shape; then they are cut into ribbons and sewed strongly

*This surrounding of the cows, is, perhaps, the strangest procedure on the islands. To fully appreciate the subject, the reader must first call to his mind's eye the fact that these female sea-lions, though small beside the males, are yet large animals; seven and eight feet long, and weighing, each, as much as any four or five average men. But, in spite of their strength and agility, fifteen or twenty Aleuts, with a rough, iron-tipped lance in their hands, will surround a drove of 50 or 150 of them by forming a noisy, gesticulating circle, gradually closing up, man to man, until the sea-lions are literally piled in a writhing, squirming, struggling mass, one above the other, three or four deep, heads, flippers, bellies, backs all so woven and interwoven in this panic-stricken heap of terrified creatures, that it defies adequate description. The natives spear the cows on top, which, as they sink in death, are mounted in turn by the live animals underneath; these meet the deadly lance, in order, and so on until the whole herd is quiet and stilled in the fatal ebbing of their heart's blood.

†When slowly sketching, by measurements, the outlines of a fine adult bull sea-lion which the ball from Booterin's rifle had just destroyed, an old "starooka" came up abruptly; not seeming to see me, she deliberately threw down a large, greasy, skin meat-bag, and whipping out a knife, went to work on my specimen. Curiosity prompted me to keep still in spite of the first sensations of annoyance, so that I might watch her choice and use of the animal's carcass. She first removed the skin, being actively aided in this operation by an uncouth boy; she then cut off the palms to both fore-flippers; the boy at the same time pulled out the moustache bristles; she then cut out its gullet, from the glottis to its junction with the stomach, carefully divested it of all fleshy attachments, and fat; she then cut out the stomach itself, and turned it inside out, carelessly scraping the gastric walls free of copious biliary secretions, the inevitable bunch of *ascaris;* she then told the boy to take hold of the duodenum end of the small intestine, and as he walked away with it she rapidly cleared it of its attachments, so that it was thus uncoiled to its full length of at least 60 feet; then she severed it, and then it was recoiled by the "melchiska", and laid up with the other members just removed, except the skin, which she had nothing more to do with. She then cut out the liver and ate several large pieces of that workhouse of the blood before dropping it into the meat-pouch. She then raked up several handfuls of the "leaf-lard", or hard, white fat that is found in moderate quantity around the viscera of all these pinnipeds, which she also dumped into the flesh-bag; she then drew her knife through the large heart, but did not touch it otherwise, looking at it intently, however, as it still quivered in unison with the warm flesh of the whole carcass. She and the boy then poked their fingers into the tumid lobes of the immense lungs, cutting out portions of them only, which were also put into the grimy pouch aforesaid; then she secured the gall-bladder and slipped it into a small yeast-powder tin, which was produced by the urchin; then she finished her economical dissection by cutting the sinews out of the back in unbroken bulk from the cervical vertebra to the sacrum; all these were stuffed into that skin bag, which she threw on her back and supported it by a band over her head; she then trudged back to the barrabkie from whence she sallied a short hour ago, like an old vulture to the slaughter; she made the following disposition of its contents: The palms were used to sole a pair of tarbosars, or native boots, of which, the uppers and knee tops were made of the gullets—one sea-lion gullet to each boot top; the stomach was carefully blown up, and left to dry on the barrabkie roof, eventually to be filled with oil rendered from sea-lion or fur-seal blubber. The small intestine was carefully injected with water and cleansed, then distended with air, and pegged out between two stakes, 60 feet apart, with little cross-slats here and there between to keep it clear of the ground. When it is thoroughly dry, it is ripped up in a straight line with its length and pressed out into a broad band of parchment gut, which she cuts up and uses in making a water-proof "kamlaikie", sewing it with those sinews taken from the back. The liver, leaf-lard, and lobes of the lungs were eaten without further cooking, and the little gall-bag was for some use in poulticing a scrofulous sore. The moustache-

together into that most characteristic water-proof garment of the world, known as the "kamlaika";* which, while being fully as water-proof as India rubber, has far greater strength, and is never affected by grease and oil. It is also transparent in its fitting over dark clothes. The sea-lions' throats are served in a similar manner, and, when cured, are made into boot tops, which are in turn soled by the tough skin that composes the palms of this animal's fore-flippers.

STOMACH-WALLS USED AS OIL-POUCHES.—Around the natives' houses, on St. Paul and St. George, constantly appear curious objects which, to the unaccustomed eye, resemble overgrown gourds or enormous calabashes with attenuated necks; an examination proves them to be the dried, distended stomach-walls of the sea-lion, filled with its oil; which, unlike the offensive blubber of the fur-seal, boils out clear and inodorous from its fat. The flesh of an old sea-lion, while not very palatable, is tasteless and dry; but the meat of a yearling is very much like veal, and when properly cooked I think it is just as good; but the superiority of the sea-lion meat over that of the fur-seal is decidedly marked. It requires some skill, in the *cuisine*, ere sausage and steaks of the *Callorhinus* are accepted on the table; while it does not, however, require much art, experience, or patience for the cook to serve up the juicy ribs of a young sea-lion so that the most fastidious palate will fail to relish it.

CARING FOR THE FLESH.—The carcass of the sea-lion, after it is stripped of its hide, and disemboweled, is hung up in cool weather by its hind-flippers, over a rude wooden frame or "labaas", as the natives call it, where, together with many more bodies of fur-seals treated in the same manner, it serves from November until the following season of May, as the meat-house of the Aleut on St. Paul and St. George. Exposed in this manner to the open weather, the natives keep their seal-meat almost any length of time, in winter, for use; and, like our old duck and bird hunters, they say they prefer to have the meat tainted rather than fresh, declaring that it is most tender and toothsome when decidedly "loud".

CHINESE DEMAND FOR WHISKERS.—The tough, elastic moustache bristles of the sea-lion are objects of great commercial activity by the Chinese, who prize them highly for pickers to their opium pipes, and several ceremonies peculiar to their joss houses. These lip bristles of the fur-seal are usually too small and too elastic for this service. The natives, however, always carefully pluck them out of the *Eumetopias*, and get their full value in exchange.

DIET OF THE SEA-LION.—The sea-lion also, as in the case of the fur-seal, is a fish-eater, pure and simple, though he, like the latter, occasionally varies his diet by consuming a limited amount of juicy sea-weed fronds, and tender marine crustaceans; but he hunts no animal whatever for food, nor does he ever molest, up here, the sea-fowl that incessantly hovers over his head, or sits in flocks without fear on the surface of the waters around him. He, like the *Callorhinus*, is, without question, a mighty fisherman, familiar with every submarine haunt of his piscatorial prey; and, like his cousin, rejects the heads of all those fish which have hard horny mouths, or are filled with teeth or bony plates.†

G. THE WALRUS OF BERING SEA (ODOBÆNUS OBESUS).

18. LIFE-HISTORY OF THE WALRUS.

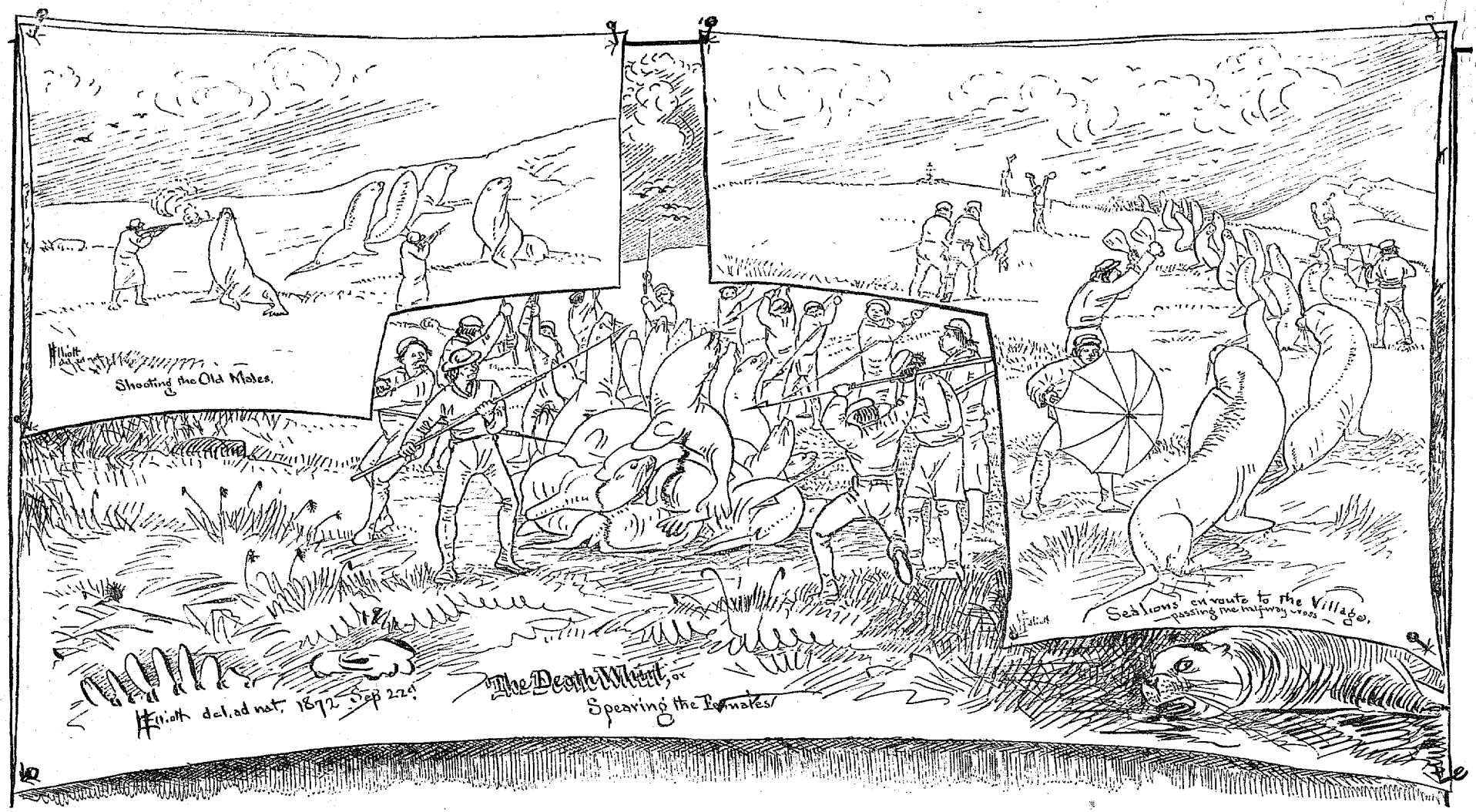
VOLUMINOUS WRITINGS RELATIVE TO THE WALRUS.—When I first set out for the seal-islands, from the Smithsonian Institution, in 1872, I fancied that, as far as the walrus was concerned, I should have nothing to learn, because of the literature on that subject which I had read, from the Congressional Library, viz:

The curious histories written by Olaus Magnus, in 1555; by Gesner, in 1558; by Martens, in 1675; by Pennant, in 1781–1792; by Buffon, in 1785; and by Cuvier, in 1816; together with an almost innumerable list of authors who have since contributed papers on the walrus and its character to nearly all the learned associations of the world.

bristles were a venture of the boy, who gathers all that he can, then sends them to San Francisco, where they find a ready sale to the Chinese, who pay about one cent apiece for them. When the natives cut up a sea-lion carcass, or one of a fur-seal, on the killing-grounds for meat, they take only the hams and the loins. Later in the season they eat the entire carcass, which they hang up by the hind-flippers on a "laabas" by their houses.

*The Aleutian name for this garment is unpronounceable in our language, and equally so in the more flexible Russian; hence the Alaskan "kamlaika," derived from the Siberian "kamläia." That is made of tanned reindeer skin, unhaired, and smoked by larch bark until it is colored a saffron yellow; and is worn over the reindeer skin undershirt, which has the hair next to the owner's skin, and the obverse side stained red by a decoction of alder bark. The kamläia is closed behind and before, and a hood, fastened to the back of the neck, is drawn over the head, when leaving shelter; so is the Aleutian kamlaika; only the one of Kolyma is used to keep out piercing dry cold, while the garment of the Bering sea is a perfect water repellant.

†Many authorities, who are quoted in regard to the habits of the hair-seals and southern sea-lions, speak with much fine detail of having witnessed the capture of sea-fowl by *Phocidæ* and *Otariidæ*. To this point of inquiry on the Pribylov islands, I gave continued close attention; because, off and around all of the rookeries large flocks of auks, arries, gulls, shags, and choochkies were swimming upon the water, and shifting thereupon incessantly, day and night, throughout the late spring, summer, and early fall. During the four seasons of my observation I never saw the slightest motion made by a fur-seal or sea-lion, a hair-seal, or a walrus toward intentionally disturbing a single bird, much less of capturing and eating it. Had these seals any appetite for sea-fowl, this craving could have been abundantly satisfied at the expense of absolutely no effort on their part. That none of these animals have any taste for water-birds I am thoroughly assured.



SPEARING THE SEA-LION COWS.

Natives bring the Sea-lion drove from Northeast Point. Shooting the old males.

With this imposing list of authorities in my mind, I thought I had reason to believe that there was nothing about this pinniped which I should find new, or even interesting to science.

THE WALRUS OF BERING SEA.—When, therefore, looking for the first time upon the walrus of Bering sea, judge of my astonishment as I beheld the animal before me. It was a new species; it was a new creature, or all that had been written by five hundred authors in regard to the appearance and behavior of its Atlantic cousin was in error. The natives who accompanied me were hurriedly summoned to my side, called from their eager task of picking up birds' eggs. "Are these walrus sick?" said I. They looked at me in astonishment; "No, they are not." "Do they always look like that?" "Serovnah,"* was the answer.

Such was my introduction to *Rosmarus arcticus* (Pallas), and the occasion of my describing it in 1873, for the first time, as the walrus of Bering sea—a distinct and separate animal, specifically, from its congener of the North Atlantic. *Odobœnus rosmarus* (Allen).†

WALRUS ON THE PRIBYLOV ISLANDS.—In early days, when the Pribylov islands were first occupied by the Russians, report has it that large numbers of these creatures frequented the entire coast line of St. Paul island, and many were found around St. George; but, being relatively more timid than the sea-lion in respect to the presence of man, they rapidly disappeared as he took possession of the land; the disappearance, however, was not total—a few of them every year were and can now be observed upon that little rocky islet, lying six miles to the southeast of the Northeast point of St. Paul island, owing to its comparative isolation; since the natives only go there once a year, and then only for a few days during the egging season.‡

SELECTION OF LANDINGS BY WALRUS HERDS.—The walrus rests upon the low rocky tables characteristic of this place, without being disturbed; hence the locality afforded me a particularly pleasant and advantageous opportunity of minutely observing these animals. My observations, perhaps, would not have passed over a few moments of general notice, had I found the picture presented by them such as I had drawn in my mind from the descriptions of the army of writers cited above; the contrary, however, stamping itself so suddenly and decidedly upon my eye, set me to work with pen and brush in noting and portraying the extraordinary brutes, as they lay grunting and bellowing, unconscious of my presence, and not ten feet from the ledge upon which I sat.§

LIFE-STUDIES OF THE HERD.—Sitting as I did to the leeward of them, a strong wind blowing at the time from seaward, which, ever and anon, fairly covered many of them with the foaming surf-spray, they took no notice of me during the three or more hours of my study. I was first surprised at observing the raw, naked appearance of the

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* Just the same.

† Allen, in reviewing the history of this species, cites the hesitating opinions of Pennant, in 1792; of Shaw, in 1800; of F. Cuvier, in 1825; of Leidy, in 1860, all of whom suggest the specific distinctness of the Bering sea walrus, but give their ideas clouded by expressed hints or mental reservations. He shows, however, that Illiger, in 1811, formally recognized three varieties, but that this author gives nowhere his reasons for so doing; he named them *Trichecus rosmarus* for the North Atlantic, and *T. obesus* and *T. divergens* for the Bering sea region and waters north of the straits thereof. Then Allen says, page 21, "I have met with nothing further touching this subject prior to Mr. H. W. Elliott's report on the seal-islands of Alaska, published in 1873, and he quotes it freely. Professor Allen has, however, done the osteological part of the work so well in his *History of North American Pinnipeds*, that now I deem it finished.

While Allen agrees with me finally in my early determination of the Bering sea walrus as a distinct species from that of the Atlantic, he seems to base all of his belief upon the osteological differentiation between them. I have had my faith in that one line of evidence as to genera and species, so sadly shaken by the amazing asymmetry and differences in the skulls and skeletons of the fur-seal which are bleaching out here side by side, thousands and tens of thousands of them, that I feel better satisfied with the characteristic external features of the pinnipeds, which are really more fixed and exact among the hundreds of thousands on the Pribylov islands. Perhaps ten thousand skulls of *Odobœnus obesus* would show a great number of examples which could not, alone by themselves, be separated from types of *O. rosmarus*. From my inspection of the wide range of variation presented in a large series of *Callorhinus* and *Eumetopias* skulls, I do not have any hesitation in saying so.

‡ As to the number of walrus on the Pribylov islands in prehistoric time, and when the Russians first took possession of the same, 1786–1787, I have not been able to find any record of the least authentic value. Beyond the general legend of the natives that in olden times the "morsjee" were wont to haul in considerable number at Novashtoshnah and over the entire extent of the north and south shores of St. Paul, while herds were also common under the precipitous sea-walls of St. George. Gavrila Sarietschev, one of the several imperial agents commissioned at intervals to examine into the affairs of the old Russian American Fur Company, in the details of his report made in December, 1805, incidentally states, speaking of the walrus, that while they had abandoned the Pribylov islands then, yet, formerly they were there in such numbers that 28,000 pounds of their teeth (tusks) were obtained in a single year; as the average weight of well assorted walrus ivory is about 8 pounds to the head, of each animal, this memorandum of the agent shows that between 3,500 and 4,000 walrus were taken then. From the quantity of old bones of *Rosmarii* which are constantly covered and uncovered by the caprice of the wind at Nahsayvernia and Novastoshnah, I should judge the Russian officer was correct.

§ These favored basaltic tables are also commented upon in similar connection by an old writer in 1775, Shuldham, who calls them "echouries"; he is describing the Atlantic walrus as it appears at the Magdalen islands: "The echouries are formed principally by nature, being a gradual slope of soft rock, with which the Magdalen islands abound, about 80 to 100 yards wide at the water side, and spreading so as to contain, near the summit, a very considerable number." The tables at Walrus island and those at Southwest point, are very much less in area than those described by Shuldham, and are a small series of low, saw-tooth jetties of the harder basalt washed in relief, from a tufa matrix; there is no room to the landward of them for many walruses to lie upon. The *Odobœnus* does not like to haul up on loose or shingly shores, because it has the greatest difficulty in getting a solid hold for its fore-flippers with which to pry up and ahead its huge, clumsy body. When it hauls on a sand beach, it never attempts to crawl out to the dry region back of the surf, but lies just awash, at high water. In this fashion they used to rest all along the sand reaches of St. Paul prior to the Russian advent in 1786–1787; and when Shuldham was inditing his letters on the habits of *Rosmarus*, *Odobœnus* was then lying out in full force and great physical peace on the Pribylov islands.

hide, a skin covered with a multitude of pustular looking warts and large boils or pimples, without hair or fur, save scattered and almost invisible hairs; the skin wrinkled in deep, flabby seam-folds, and marked by dark-red venous lines, which showed out in strong contrast through the thicker and thinner yellowish-brown cuticle, that in turn seemed to be scaling off in places as if with leprosy; indeed, a fair expression of this walrus-hide complexion, if I may use the term, can be understood by the inspection of those human countenances in the streets and on the highways of our cities which are designated as the faces of "bloats". The forms of *Rosmarus* struck my eye at first in the most unpleasant manner, and the longer I looked at them the more heightened was my disgust; for they resembled distorted, mortified, shapeless masses of flesh; the clusters of swollen watery pimples, which were of yellow parboiled flesh-color, and principally located over the shoulders, and around the necks, painfully suggested unwholesomeness.

On examining the herd individually, and looking over perhaps 150 specimens directly beneath and within the purview of my observation, I noticed that there were no females among them; they were all males, and some of the younger ones had considerable hair, or enough of that close, short, brown coat to give a hairy tone to their bodies—hence I believe that it is only the old, wholly matured males which offered to my eyes their bare and loathsome nakedness.

I observed, as they swam around, and before they landed, that they were clumsy in the water, not being able to swim at all like the *Phocidæ* and the *Otaridæ;* but their progress in the sea was wonderfully alert when brought into comparison with that terrestrial action of theirs; the immense bulk and weight of this walrus contrasted with the size and strength of its limbs, renders it simply impotent when hauled out of the water, and on the low rocky beaches or shelves upon which it rests. Like the seal, however, it swims entirely under water when traveling, but it does not rise, in my opinion, so frequently to take breath; when it does, it blows or snorts not unlike a whale. Often I have noticed this puffing snort of these animals, since the date of these observations on Walrus islet, when standing on the bluffs near the village of St. Paul and looking seaward; on one cool, quiet morning in May especially, I followed with my eye a herd of walrus, tracing its progress some distance off and up along the east coast of the island very easily by the tiny jets of moisture or vapor from the confined breath, which the animals blew off as they rose to respire.*

METHODS OF LANDING: CLUMSY EFFORTS.—In landing and climbing over the low, rocky shores at Morserovia,† this animal is fairly as clumsy and almost as indolent as the sloth. A herd crowds up from the water, one after the other, in the most ungainly manner, accompanying their movements with low grunts and bellowings; the

* Mariners, while coasting in the Arctic, have often been put on timely footing by the walrus fog-horn snorting and blowing when a ship dangerously sails silently in through dense fog toward land or ice-floes, upon which these animals may be resting; indeed, these uncouth monitors to this indistinct danger rise and bob under and around a vessel like so many gnomes or demons of fairy romance; and the sailors may well be pardoned for much of the strange yarning which they have given to the reading world respecting the sea-horse, during the last three centuries; but when we find Albert Magnus, and Gesner the sage, talking in the following extraordinary manner of the capture of *Rosmarus*, we are constrained to laugh heartily; especially do we so, because a more shy, timid brute than the walrus of Bering sea never existed when he is hunted by man, unless it be the sea-otter.

Says Gesner in 1558: "Therefore these fish called *Rosmarii* or *Morsii*, have heads fashioned like to an oxe, and a hairy skin, and hair growing as thick as straw or corn-reeds, that lie loose very largely. They will raise themselves with their teeth, as by ladders, to the very tops of rocks that they may feed upon the dewie grasse, or fresh water, and role themselves in it, and then go to the sea again, unless in the mean time they fall very fast asleep, and rest upon the rocks, for then the fishermen make all the haste they can and begin at the tail, and part the skin from the fat; and into this that is parted they put most strong cords, and fasten them on the rugged rocks or trees that are near; and then they throw stones at his head, out of a sling, to raise him, and they compel him to descend spoiled of the greatest part of his skin which is fastened to the ropes; he being thereby debilitated, fearful and half dead, he is made a rich prey, especially for his teeth, that are very pretious amongst the *Scythians*, the *Muscovites*, *Russians* and Tartars (as ivory amongst the Indians) by reason of its hardness, whiteness and ponderousnesse".

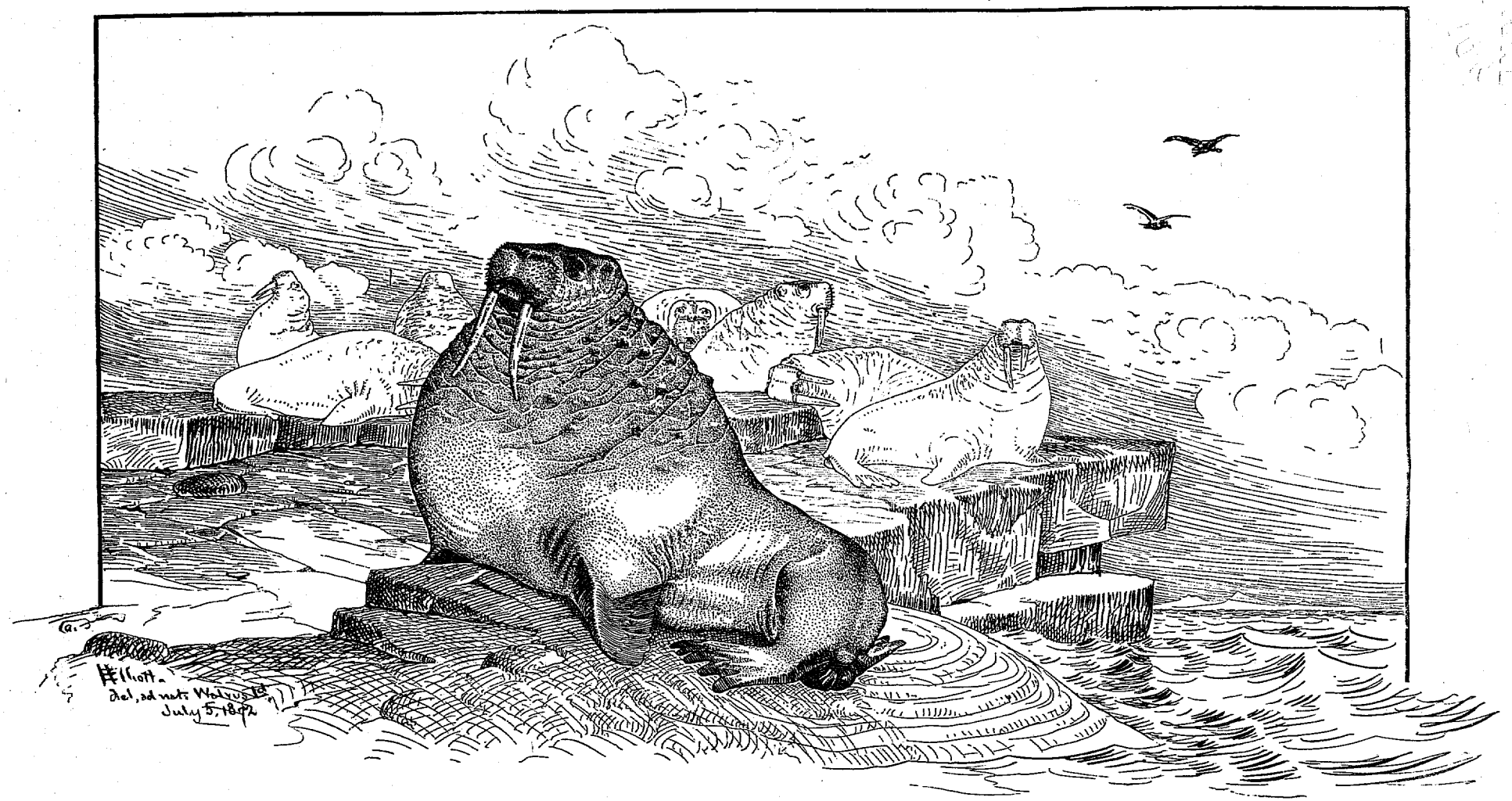
In spite of the many remarkable and well authenticated stories printed as to the ferocity of the Atlantic walrus when hunted, it can be safely said that no boat has ever been assailed by the Alaskan species, which is as large if not larger, and in every respect quite as able-bodied; the Eskimo capture them without danger or difficulty—mere child's play or woman's work—spearing and lancing. By spearing, a line of walrus hide is made fast to the plethoric body of *Rosmarus*, and when it has expended its surplus vitality by towing the natives a few miles in a mad frenzied burst of swimming, the bidarrah is quietly drawn up to its puffing form, close enough to permit the coup of an ivory-headed lance, then towed to the beach at high water; when the ebb is well out, the huge carcass is skinned by its dusky butchers, who cut it up into large square chunks of flesh and blubber, which are deposited in the little "Dutch-oven" caches of each family that are waiting for its reception.

Dressing the walrus hides is the only serious hard labor which the Alaskan Innuit subjects himself to; he cannot lay it entirely upon the women, as do the Sioux when they spread buffalo bodies all over the plains; it is too much for female strength alone, and so the men bear a hand right lustily in the business. It takes from four to six stout natives, when a green walrus hide is removed, to carry it to the sweating hole where it is speedily unhaired; then stretched alternately upon air-frames and pinned over the earth, it is gradually scraped down to the requisite thinness for use in covering the bidarrah skeletons, etc.

There are probably six or seven thousand human beings in Alaska who live alone by virtue of the existence of *Rosmarus;* and, every year, when the season opens, they gather together by settlements, as they are contiguous, and discuss the walrus chances for the coming year as earnestly and as wisely as our farmers do, for instance, regarding the prospects for corn and potatoes. But the Eskimo hunter is a sadly improvident mortal, though he is not wasteful of morse life; while we are provident, and yet wasteful of our resources.

If the north pole is ever reached by our people, they will do so only when they can eat walrus meat, and get plenty of it; at least that is my belief; and knowing now what the diet is, I think the journey to the hyperborean ultima is a long one, though there is plenty of meat, and many men who want to try it.

† *Morserovia*, the Russian name for Walrus island; the natives also call Otter island by the Russian title of *Bobrovia*.



THE WALRUS OF BERING SEA.

(Rosmarus arcticus.)

A life-study of an old male by the author: Walrus Island, July 5, 1872.

first one up from the sea no sooner gets composed upon the rocks for sleep, than the second one comes along, prodding and poking with its blunted tusks, demanding room also, and causes the first to change its position to another location still farther off and up from the water, a few feet beyond; then the second is in turn treated in the same way by a third, and so on until hundreds will be slowly packed together on the shore, as thickly as they can lie, never far back from the surf, however, pillowing their heads upon the bodies of one another, and not acting at all quarrelsome toward each other. Occasionally, in their lazy, phlegmatic adjusting and crowding, the posteriors of some old bull will be lifted up, and remain elevated in the air, while the passive owner sleeps with its head, perhaps, beneath the pudgy form of its neighbor.

USE OF TUSKS.—A great deal has been written in regard to the manner in which the walrus uses his enormous canines; many authors have it that they are employed by *Rosmarus* as landing hooks, so that by sticking them into the icy floes, or inserting them between rocky interstices or inequalities, the clumsy brute aids his hauling out from the sea. I looked here at Walrus island very closely for such manifestation of their service to the members of the herd, which was continually augmented by fresh arrivals from the surf while under my eye. They did not in a single instance use their tusks in this manner; it was all done by the fore-flippers, and "boosting" of exceptionally heavy surf which rolled in at wide intervals, and for which marine assistance the walrus themselves seemed to patiently wait.*

With all this apparent indifference, however, they have established their reputation for vigilance in spite of it; and they resort to a very singular method of keeping guard, if I may so term it. In this herd of three or four hundred male walrus that were under my eyes, though nearly all were sleeping, yet the movement of one would disturb the other, which would raise its head in a stupid manner, for a few moments, grunt once or twice, and before lying down to sleep again, it would strike the slumbering form of its nearest companion with its tusks, causing that animal to rouse up in turn for a few moments also, grunt, and pass the blow on to the next, lying down in the same manner. Thus the word was transferred, as it were, constantly and unceasingly around, always keeping some one or two aroused, which consequently were more alert than the rest.

HELPLESSNESS ON LAND.—In moving on land they do not seem to have any physical power in the hind limbs; these are usually dragged and twitched up behind, or feebly flattened out at right angles to the body; terrestrial progression is slowly and tediously made by a dragging succession of short steps forward on the fore-feet; but, if the alarm is given, it is astonishing to note the contrast which they present in their method of getting back to sea; they fairly roll and hustle themselves over and into the waves.

How long they remain out from the water, in this country, I am unable to say; but, stored up as they are with such an enormous supply of surplus fat, dull and sluggish in temperament, I should think that they could sustain a fasting period equal to that of the *Otariidæ*, if not superior to them in endurance.

These adult males before me looked very much larger than I expected to find the walrus,† and it was fortunate

* I have seen no description of this Pacific walrus which is as good as is the first notice of it ever made to English readers, by Captain Cook, in his *Last Voyage*; it is, as far as it goes, precisely in accordance with my views of the same animal, nearly a century later, viz, July, 1872. He said: "They lie in herds of many hundreds upon the ice, huddling one over the other like swine, and roar or bay very loud, so that in the night, or in foggy weather, they gave us notice of the vicinity of the ice before we could see it. We never found the whole herd asleep; some being always on the watch. These, on the approach of the boat, would wake those next to them, and the alarm being thus gradually communicated, the whole herd would be awake presently. But they were seldom in a hurry to get away till after they had once been fired at, when they would tumble one over the other into the sea in the utmost confusion, and if we did not at the first discharge kill those we fired at, we generally lost them, though mortally wounded. They did not appear to be that dangerous animal some authors have described, not even when attacked. They are rather more so to appearance than in reality. Vast numbers of them would follow, and some come close up to the boats; but the flash of a musket in the pan, or even the bare pointing of one at them, would send them down in an instant. The female will defend the young one to the very last, and at the expense of her own life, whether in the water or upon the ice. Nor will the young one quit the dam though she be dead; so that, if you kill one you are sure of the other. The dam, when in the water, holds the young one between her fore-fins." [*Cook's* (1778) *Voyages to the Pacific Ocean*, etc., vol. ii, p. 458. London, 1785.]

I do not wish to appear in the light of desiring to detract one iota from that credit of accurate description which so justly belongs to Cook; but he himself did not indicate that he thought the Pacific walrus a distinct species from its Atlantic congener; his figure of the Bering sea *Rosmarus* is entirely grotesque; a human face with beard, a thin neck and immensely inflated posteriors, and fore-flippers divided up into distinct fingers, make a creature as totally unlike *Odobænus obesus* as need be; yet, naturalists have gravely spoken of it as "excellent"! Had Captain Cook possessed the same explicit and graphic power of description in his pencil that characterizes his pen, I know full well that this caricature above referred to [*Cook's Voyage to the Pacific Ocean*, etc., 1776–1780, vol. ii, pl. lii] would never have appeared.

The pinnipeds are, perhaps, of all animals, the most difficult subjects that the artist can find to reproduce from life; there are no angles or elbows to seize hold of—the lines of body and limbs are all rounded, free and flowing; yet the very fleshiest examples never have that bloated, wind-distended look which most of the figures published give them. One must first become familiarized with the restless, varying attitudes of these creatures, by extended personal contact and observation, ere he can satisfy himself with the result of his drawings, no matter how expert he may be in rapid and artistic delineation. Life-studies, by artists, of the young of the Atlantic walrus have been made in several instances, but of the mature animal, there is nothing extant of that character.

†The most satisfactory result that I can obtain from a careful study of what is on record as to the length of the adult ♂ Atlantic walrus is a mean of 10 feet 7 inches; while my observations on Walrus island give the Bering sea ♂ adult walrus an average of 11 feet; the only two examples which I measured were both over this figure, viz, 11 feet 9 inches, and 12 feet 7 inches, from tip of muzzle to the skinny nodule or excrescence, scientifically known as the tail; but they were striking exceptions in superior size to all the others in the large herd of old males before my eyes at the time, and were singled out for shooting on that score. I fully realize this, because in July,

for the accuracy and good sense of these notes now published, that one of the natives kindly volunteered to shoot any of the bulls, of which I might select, after I should have finished my sketching and writing. I therefore, when my drawings were completed, selected the largest animal in the group; and, promptly at my signal, a rifle ball crashed into the skull at the only place where it could enter, just on the line of the eye and the ear, midway between them.

GREAT SIZE OF THE WALRUS.—This animal, thus slain, certainly was the largest one of the entire herd, and the following measurements and notes can, therefore, be relied upon: it measured 12 feet 7 inches from its bluff nostrils to the tip of its excessively abbreviated tail, which was not more than 2½ or 3 inches long; it had the surprising girth of 14 feet. The immense mass of blubber on the shoulders and around the neck made the head look strangely small in proportion, and the posteriors decidedly attenuated; indeed, the whole weight of the animal was bound up in its girth anteriorly; it was a physical impossibility for me to weigh this brute, and I therefore can do nothing but make a guess, having this fact to guide me: that the head cut directly off at the junction with the spine, or the occipital or atlas joint, weighed 80 pounds; that the skin, which I carefully removed with the aid of these natives, with the head, weighed 570 pounds. Deducting the head, and excluding the flippers, I think it is safe to say that the skin itself would not weigh less than 350 pounds, and the animal could not weigh much less than a ton—from 2,000 to 2,200 pounds.

CHARACTERS OF HEAD.—The head has a decided flattened appearance, for the nostrils, eyes, and ear-spots seem to be placed nearly on top of the cranium; the nasal apertures are literally so, opening directly over the muzzle; they are oval, and closed parallel with the longitudinal axis of the skull, and when dilated are about an inch in their greatest diameter.

The tusks, or canines, are set firmly under the nostril-apertures in deep, massive, bony pockets, giving that strange, broad, square-cut front of the muzzle, so characteristic to the physiognomy.

The upper lips of the walrus of Bering sea are exceedingly thick and gristly, and the bluff, square muzzle is studded, in regular rows and intervals, with a hundred or so short, stubby, gray-white bristles, varying in length from one-half to three inches. There are a few very short and much softer bristles set, also, on the fairly hidden chin of the lower jaw, which closes up under the projecting snout and muzzle, and is nearly concealed by the enormous tushes, when laterally viewed.

PECULIARITIES OF THE EYES.—The eyes are small, but prominent; placed nearly on top of the head, and protruding from their sockets, bulge like those of the lobster. The iris and pupil of this eye is less than one-fourth of the exposed surface; the sclerotic coat swells out from under the lids when they are opened, and is of a dirty, mottled, coffee-yellow and brown, with an occasional admixture of white; the iris itself is light brown, with dark brown rays and spots. I noticed that whenever the animal roused itself, instead of turning its head, it rolled its eyes about, seldom moving the cranium more than to elevate it. The eyes seem to move, rotating in every direction when the creature is startled, giving the face of this monster a very extraordinary attraction, especially when studied by an artist. The expression is just indescribable. The range of sight enjoyed by the walrus out of water, I can testify, is not well developed; for, after throwing small chips of rock down upon the walruses near me, several of them not being ten feet distant, and causing them only to stupidly stare and give vent to low grunts of astonishment, I then rose gently and silently to my feet, standing boldly up before them; but then, even, I was not noticed, though their eyes rolled all over from above to under me. Had I, however, made a little noise, or had I been standing as far as 1,000 yards away from them to the windward, they would have taken the alarm instantly and tumbled off into the sea like so many hustled wool-sacks; for their sense of smell is of the keen, keenest.

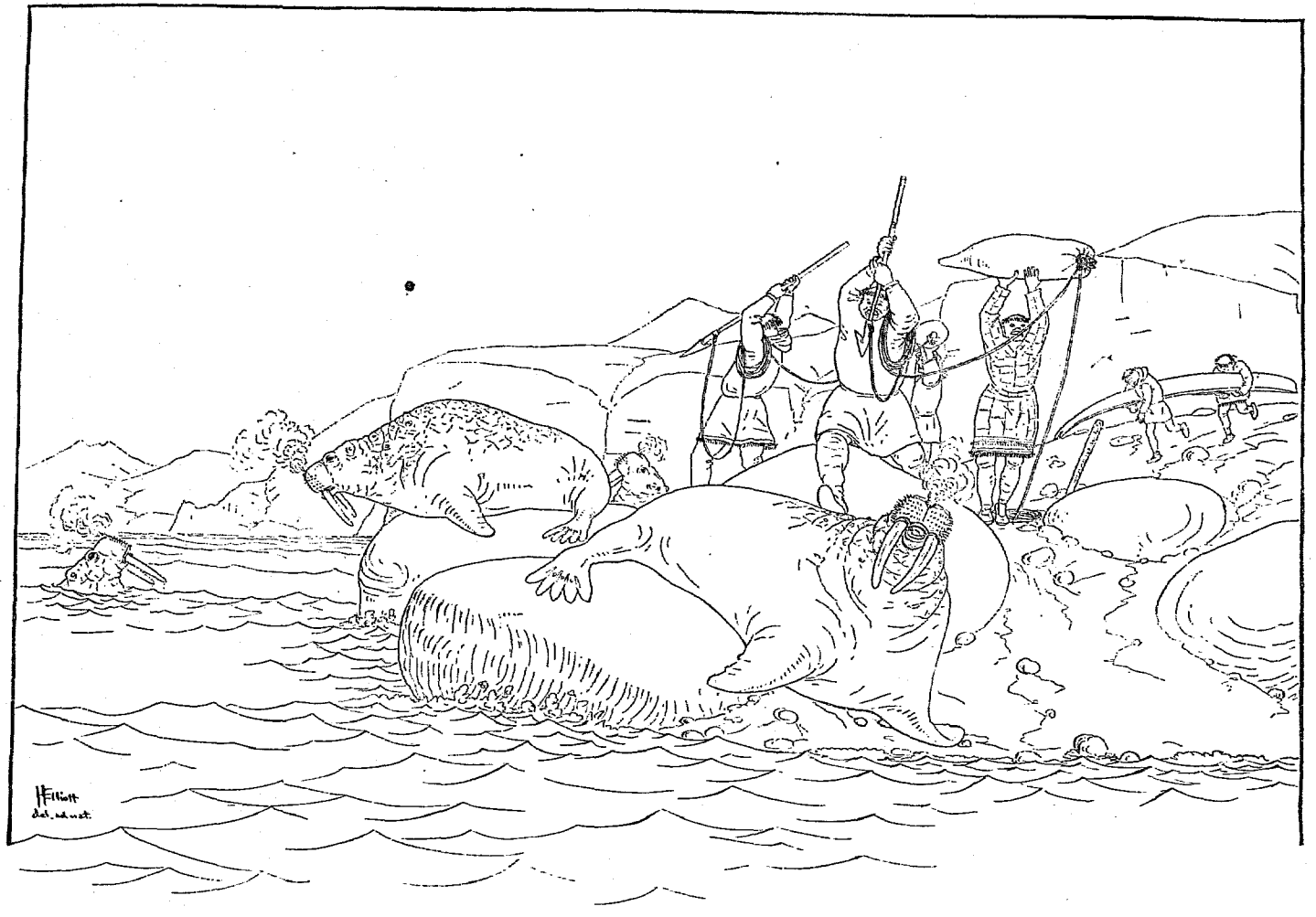
ACUTE HEARING.—The ears of the walrus, or rather the auricles to the ears, are on the same lateral line at the top of the head with the nostrils and eyes, the latter being just midway between. The pavilion, or auricle, is a mere fleshy wrinkle or fold, not at all raised or developed; and, from what I could see of the *meatus externus*, it was very narrow and small; still, the natives assured me that the *Otariidæ* had no better organs of hearing than "Morsjee".

LOOSE SETTING OF THE TUSKS.—The head of the male walrus, to which I have alluded, and from which I afterward removed the skin, was 18 inches long between the nostrils and the post-occipital region; and, although the enormous tusks seemed to be so firmly planted in their osseous sockets, judge of my astonishment when one of the younger natives flippantly struck a tusk with a wooden club quite smartly, and then easily jerked the tooth forth. I had frequently observed that it was difficult to keep the teeth from rattling out of their alveoli in any of the best skulls I had gathered of the fur-seals and sea-lions; especially difficult in the case of the latter. But again, on this interesting subject of dentition, it is best that I refer to Dr. Allen. Repetition of his admirable diagnosis is unnecessary here.

UNUSUAL THICKNESS OF THE SKIN.—The thickness of the hide* of the walrus is, after all, in my opinion, its

1874, when I revisited Walrus island, I caused a younger male, and one tolerably well haired over with a very dark brown and short coat, to be shot; when measured it gave a length of only 10 feet 9 inches, and would not weigh, in my best estimation, more than 1,200 to 1,500 pounds. It was, however, fully matured. Thus the "greater size" which I recognized in 1872, means an increased length of five or six inches to the Alaska form, with a relative greater avoirdupois. The complete and uniform unhairing of the old Alaskan male *Odobænus*, is another very characteristic feature in different expression from Atlantic herds.

*While savage man has utilized the tough hide of *Rosmarus* and *Obesus*, the skin was also used by the Russians themselves to cover the packages of furs sent from Sitka to Kiachta, China; the skin was there stripped and again sewed anew over the chests of tea that were



PLUNGING THE HARPOON.

Innuits of St. Lawrence Island, Alaska, making fast to Walruses surprised by the Eskimo while hauled up on the sea-beaches at Kagallegak.

most anomalous feature. I remember well how surprised I was when I followed the incision of the broad-axe used in beheading the specimen shot for my benefit, to find that the skin over the shoulders and around the throat and chest was three inches thick—a puffy, spongy epidermis, outward hateful to the sight, and inwardly resting upon the slightly acrid fat or blubber so characteristic of this animal. Nowhere is this hide, upon the thinnest point of measurement, less than half an inch thick. It feeds exclusively upon shellfish (*Lamellibranchiata*), or clams principally, and also upon the bulbous roots and tender stalks of certain marine plants and grasses which grow in great abundance over the bottoms of broad, shallow lagoons and bays of the main Alaskan coast. I took from the paunch of the walrus above mentioned, more than a bushel of crushed clams in their shells, all of which that animal had evidently just swallowed, for digestion had scarcely commenced. Many of those clams in that stomach, large as my clenched hands, were not even broken; and it is in digging this shellfish food that the services rendered by the enormous tusks become apparent.*

COWARDICE OF THE WALRUS OF BERING SEA.—It may not accord with the singular tales told, on the Atlantic side, about the uses of these gleaming ivory teeth, so famous and conspicuous; but I believe that the Alaskan walrus employs them solely in the labor of digging clams and rooting bulbs from those muddy oozes and sand-bars in the estuary waters peculiar to his geographical distribution. Certainly, it is difficult for me to reconcile the idea of such uncouth, timid brutes, as were those spread before me on Walrus islet, with any of the strange chapters written as to the ferocity and devilish courage of the Greenland morse. These animals were exceeding cowardly; abjectly so. It is with the greatest difficulty that the natives, when a herd of walruses are surprised, can get a second shot at them; so far from clustering attacks around their boats, it is the very reverse; and the hunter's only solicitude is which way to travel in order that he may come up with the fleeing animals as they rise to breathe. Again, I visited Walrus islet in 1874, accompanied by Lieutenant Maynard, United States navy, and the captain of the revenue-cutter Reliance. We rowed from the ship directly toward the islet, to a point where we saw the accustomed and expected sight of walrus lying thereon. The wind was fair for us and we came up almost to within a boat's oar distance of the dozing, phlegmatic herd. One was singled out, and Captain Baker shot it—his first walrus; the whole herd, as usual, hustled with terrible energy into the water, and all around our boat, for we had not landed, and they did not rise about or near us to give one snort of defiance, or to give us the faintest suggestion of any disposition to attack us, but they disappeared unpleasantly soon—too quickly.

ABSENCE OF FEMALES ON WALRUS ISLAND.—As I have said before, there are no females on this island, and I can therefore say nothing about them; I regret it exceedingly. On questioning the natives, as we returned, they told me that the walrus of Bering sea was monogamous; and that the difference between the sexes in size, color, and shape is inconsiderable; or, in other words, that until the males are old, the young males and the females of all ages are not remarkably distinct, and would not be at all if it were not for the teeth; they said that the female brings forth her young, a single calf, in June, usually, on the ice-floes in the Arctic ocean, above Bering straits, between point Barrow and cape Seartze Kammin; that this calf resembles the parent in general proportions and color when it is hardly over six weeks old, but that the tusks (which give it its most distinguishing expression) are not visible until the second year of its life; that the walrus mother is strongly attached to her offspring,† and nurses it later through the season in the sea; that the walrus sleeps profoundly in

received in exchange for these furs thus enveloped, and which were carried hence to Moscow. Here the soundest portions of the hide remaining on the boxes were finally cut up and stamped into "kopecks" and a variety of small change, in time, to revisit its native seas; used as a circulating medium, for value received, throughout all Alaska where the Russians held power. A leather currency was long known to that country, and old Philip Volkov, of St. Paul, told me that he never saw silver or gold coin used on the seal-islands until our people brought it in 1868. These walrus parchment roubles were worth much less than their face value—sometimes only one-third. The Russians also made harness out of walrus leather. As long as the weather remained cold and dry the wear of this material was highly satisfactory, but woe to the "kibitscha" if caught out in a rain storm! The walrus harness then stretches like india-rubber, and the horses fairly leave the vehicle far behind, sticking in the road, though the traces are unbroken.

*It is, and always will be, a source of sincere regret to me and my friends, that I did not bodily preserve this huge paunch and its contents. It would have filled a half barrel very snugly, and then its mass of freshly swallowed clams (*Mya truncata*), filmy streaks of macerated kelp, and fragments of crustaceans, could have been carefully examined during a week of leisure at the Smithsonian Institution. It was, however, ripped open so quickly by one of the Aleuts, who kicked the contents out, that I hardly knew what had been done, ere the strong-smelling subject was directly under my nose. The natives then were anxious that I should hurry through with my sketches, measurements, etc., so that they might the sooner push off their egg-laden bidarrah and cross back to the main island, before the fogs would settle over our homeward track, or the rapidly rising wind shift to the northward and imperil our passage. Weighty reasons, these, which so fully impressed me, that this unique stomach of a *carnivora* was overlooked and left behind; hence, with the exception of curiously turning over the clams (especially those uncrushed specimens), which formed the great bulk of its contents, I have no memoranda or even distinct recollection of the other materials that were incorporated. The olivaceous green color of its soft, pasty excrement must be derived from eating *chlorospermæ* and divers branches of algoid growth.

†That the sea-lion and the fur-seal should be so apathetic when danger to their young arises, and that the clumsy, timid walrus fights for their protection to the death, under the same circumstances, is somewhat strange. According to all reports which I can gather from reputable authority, notably Captain Cook's brief, yet explicit, account, the walrus never deserts its young in that manner, hitherto described, so characteristic of the *Otariidæ* of Bering sea; this odd contrast in behavior is worthy of further attention, as far as

the water, floating almost vertically, with barely more than the nostrils above water, and can be easily approached if care is taken as to the wind, so as to spear it or shove a lance into its bowels; that the bulls do not fight as savagely as the fur-seal or the sea-lion; that the blunted tusks of these combatants seldom do more than bruise their thick hides; that they can remain under water nearly an hour, or about twice as long as the seals; and that they sink like so many stones, immediately after being shot at sea.*

FIRST RECORD OF THE OCCURRENCE OF FEMALES.—The reason why this band of males, and many of them old ones, should be here to the exclusion of females throughout the year, is not plain. The natives assured me that walrus females, or their young, never have been seen around the shores of these islands; but I have trustworthy advices from the village of St. Paul, at the date of this publication, declaring the fact of the capture of a female on Walrus islet last fall, the first one ever recorded.

GEOGRAPHICAL DISTRIBUTION OF THE WALRUS OF ALASKA.—The walrus has, however, a very wide range of distribution in Alaska, though not near so great as in prehistoric times.† They abound to the eastward and southeastward of St. Paul, over in Bristol bay, where great numbers congregate on the sand-bars and flats, now flooded, now bared by the rising and ebbing of the tide. They are hunted here to a considerable extent for their ivory; no walrus are found south of the Aleutian islands; still, not more than forty-five or fifty years ago, small gatherings of these animals were killed here and there on the islands between Kadiak and Oonimak pass; the greatest aggregate of them, south of Bering straits, will always be found in the estuaries of Bristol bay and on the north side of the peninsula.

PREHISTORIC RANGE OF THE WALRUS.—Geologists find the record of the great ice period well filled up by the range of the walrus, then, as far down on the Atlantic coast as the littoral margins of South and North Carolina; and its fossil remains are common in the diluvial deposits of England and France, while the phosphate beds of New Jersey are exceedingly rich in old walrus bones; but, within historic times, there is no evidence that points to the existence of the walrus on the New England coast. During the last half of the sixteenth century they are known to have frequented the southern confines of Nova Scotia. That hardy navigator, James Cartier, tells us, in his quaint vernacular, that in May, 1534, he met at the island of "Ramea" (probably Sable island), sporting in the sea, "very greate beastes, as greate as oxen, which have two greate teeth in their mouths like unto Elephant's teeth, & live also in the Sea. We saw them sleeping on the banke of the water; wee, thinking to take it, went with our boates, but so soon as he heard us he caste himselfe into the sea". Another old salt, "Thomas James, of Bristoll," speaking of the same subject shortly after, says, "the fish cometh on banke (to do their kind) in April, May, and June, by numbers of thousands, which fish is very big, and hath two great teeth; and the skin of them is like Beeffes leather; and they will not away from their yong ones. The yong ones are as good meat as Veale. And with the bellies of five of the saide fishes they make a hogshead of Traine, which Traine is very sweet, which,

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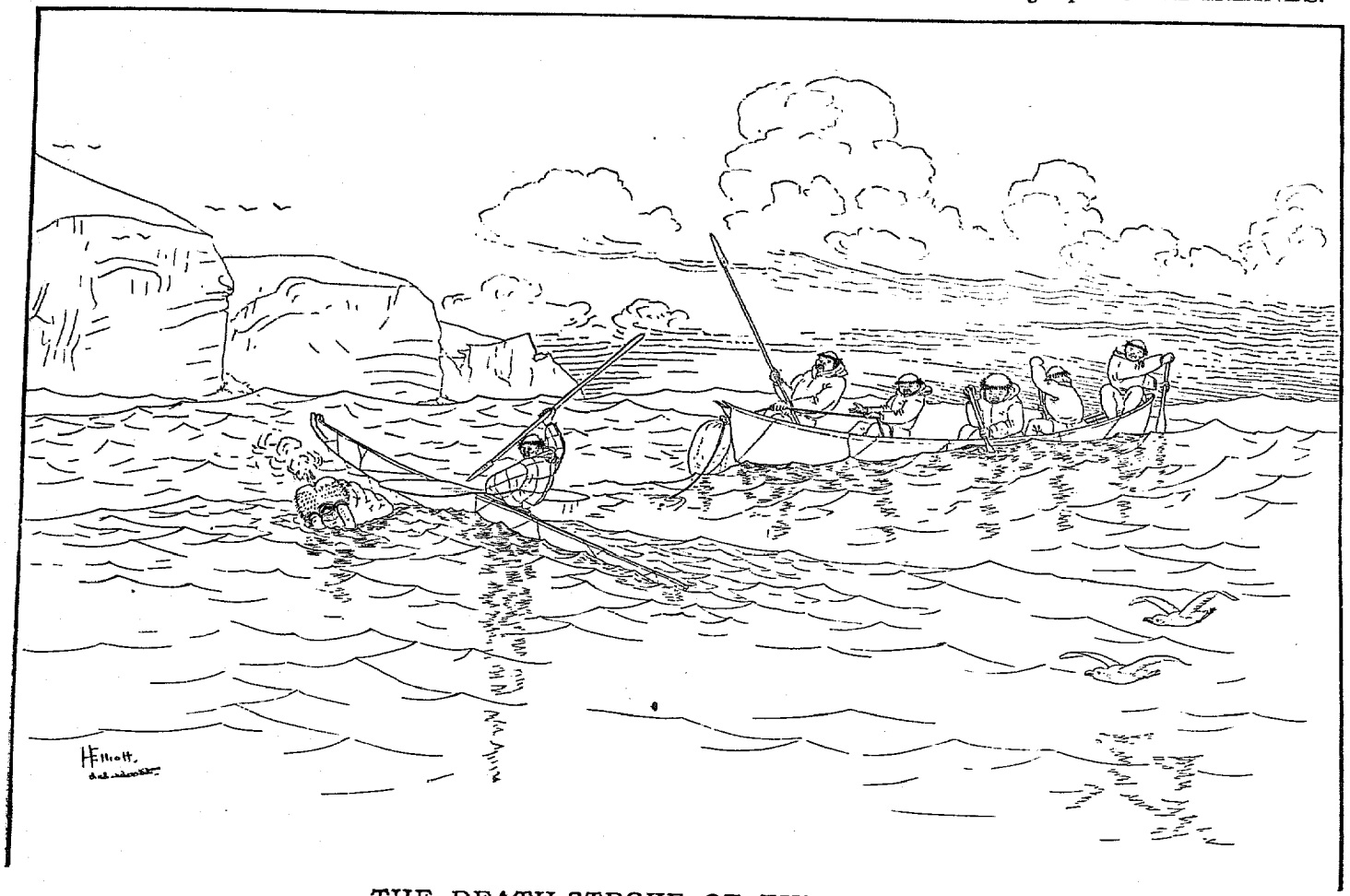
the walrus is concerned. There were no females or young among the herds of *Rosmarus* which I observed at Walrus island; hence, I am unable myself to give any facts based upon life-studies.

The reported affection and devotion of the mother walrus seems only natural, being, as it is, the rule throughout all the higher grades of mammalia; while this attitude of the sea-lion and fur-seal is decidedly opposed to it; and, were it not that it was so plainly presented in a thousand and one cases to my senses, I should have seriously doubted its correctness. Still, the best authority that I can recognize on the habits of the *Phocidæ*, Kumlein, says that the hair-seals all display the same indifference which I portray in this respect as characteristic of the fur-seal and sea-lion.—[Kumlein: *Contributions to the Natural History of Arctic America. Bull. U. S. National Museum:* Washington, p. 59, 1879.]

*I personally made no experiments touching the peculiarity of sinking immediately after being shot; of course, on reflection, it will appear to any mind that all seals, no matter how fat or how lean, would sink instantly out of sight, if not killed at the stroke of the bullet; even if mortally wounded, the great involuntary impulse of brain and muscle would be to dive and speed away; for all swimming is submarine when the pinnipeds desire to travel.

Touching this mooted question, I had an opportunity when in Port Townsend, during 1874, to ask a man who had served as a partner in a fur-sealing schooner off the straits of Fuca. He told me that unless the seal was instantly killed by the passage of the rifle bullet through its brain, it was never secured, and would sink before they could reach the bubbling wake of its disappearance; if, however the aim of the marksman had been correct, then the body was invariably taken within five to ten minutes after the shooting. Only one man did the shooting; all the rest of the crew, 10 to 12 white men and Indians, manned canoes and boats which were promptly dispatched from the schooner, after each report, in the direction of the shooting. How long one of the bodies of these "clean" killed seals would float, he did not know; the practice always was to get it as quickly as possible, fearing that the bearings of its position, when shot from the schooner, might be confused or lost; he also affirmed that, in his opinion, there were not a dozen men on the whole northwest coast who were good enough with a rifle, and expert at distance calculation, to shoot fur-seals successfully from the deck of a vessel on the ocean. The Indians of Cape Flattery get most of the pelagic fur-seals by cautiously approaching from the leeward when they are asleep, and throwing line darts or harpoons into them before they awaken.

†I have been frequently questioned whether, in my opinion, it was more than a short space of time ere the walrus was exterminated or not, since the whalers had begun to hunt them in Bering sea and the Arctic ocean. To this I frankly make answer, that I do not know enough of the subject to give correct judgment. The walrus spend most of their time in waters that are within reach of these skillful and hardy navigators; and if they (the walrus) are of sufficient value to the whaler, he can, and undoubtedly will, make a business of killing them, and work the same sad result that he has brought about with the mighty schools of cetacea, which once whistled and bared their backs throughout the now deserted waters of Bering sea in perfect peace and seclusion prior to 1842. The returns of the old Russian America Company show that an annual average of 10,000 walrus have been slain by the Eskimo since 1799 up to 1867. There are a great many left yet. But unless the oil of *Rosmarus* becomes very precious, commercially, I think the shoal waters of Bristol bay and Kuskokvim mouth, together with the eccentric tides thereof, will preserve it indefinitely. Forty years ago, when the North Pacific was the rendezvous of



THE DEATH-STROKE OF THE WALRUS.

Eskimo lancing the exhausted Walrus, St. Lawrence Island.

Mahlemoot dress, bidarka, baidar, etc., of Alaska.

if it will make sope, the King of Spaine may burne some of his Olive trees." (!) This spice of Yankee enterprise in "sope", evidently, did not come to a successful head.*

THE WALRUS "BIDARRAH".—The finest bidarrah skin-boats of transportation that I have seen in this country, were those of the St. Lawrence natives; these were made out of dressed walrus hides, shaved and pared down by them to the requisite thickness, so that when they were sewed with sinews to the wooden whalebone-lashed frames of these boats, they dried into a pale, greenish-white, prior to oiling; and were even then almost translucent, tough and strong.

USES OF WALRUS HIDES.—Until I saw the bidarrahs of the St. Lawrence natives in 1874, I was more or less inclined to believe that the tough, thick, and spongy hide of the walrus would be too refractory in dressing for use in covering such light frames, especially those of the bidarka; but the manifest excellence and seaworthiness of these Eskimo boats satisfied me that I was mistaken. I saw, however, abundant evidence of the much greater labor required in tanning or paring down the thick cuticle to that thin, tough transparency so marked on their bidarrahs; for the pelt of the hair-seal, or sea-lion, does not require any more attention when applied to this service than simply unhairing it; this is done by first sweating the "loughtak" in piles, then rudely, but rapidly, scraping, with blunt knives or stone flensers, the hair off in large patches at every stroke; the skin is then air-dried, being stretched on a stout frame, where, in the lapse of a few weeks, it becomes as rigid as a board. When required for use thereafter, it is soaked in water until soft or "green" again, then it is sewed with sinews, while in this fresh condition, tightly over the slight wooden skeleton of the bidarka or the heavier frame of the bidarrah. In this manner the skin-boats and lighters at the islands are covered; then they are air-dried thoroughly before oiling, which is done when the skin has become well indurated, so as to bind the ribs and keel as with an iron plating; the thick, unrefined seal-oil keeps the water out for twelve to twenty hours, according to the character of the hides; when, however, the skin-covering begins to "bag in" between the ribs of the frame, then it is necessary to haul the bidarrah out and air-dry it again, and re-oiling. If attended to thoroughly and constantly, those skin-covered boats are the best species of lighter which can be used at these islands, for they will stand more thumping and pounding on the rocks and alongside ship than all wooden, or even corrugated iron lighters could endure, and remain seaworthy.

MANNER OF DRESSING WALRUS AND SEA-LION HIDES.—I noticed that the St. Lawrence Eskimo pared the walrus hide down from the outer surface or hairy side; while at St. Paul, when it became necessary to reduce the thickness of a sea-lion's skin at spots around the neck and shoulders, the paring was done on the fleshy side. Very little thinning, however, was needed in the case of sea-lion "loughtak".†

GASTRONOMIC QUALITIES OF WALRUS MEAT.—The flavor of the raw, rank mollusca, upon which it feeds, seems to permeate the fiber of the flesh, making it very offensive to the civilized palate; but the Eskimos, who do

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the greatest whaling fleet that ever floated, those vessels could not, nor can they now, approach nearer than sixty or even eighty miles of the muddy shoals, sands, and bars upon which the walrus rest there; scattered in herds of a dozen or so in numbers up to bodies of thousands; living in lethargic peace, and almost unmolested, except in several small districts which are carefully hunted over by the natives of Oogashik for oil and ivory. I have been credibly informed that they also breed in Bristol bay, and along the coast as far north as Cape Avinova, during some seasons of exceptional rigor in the Arctic.

*I depart from the Pacific walrus, for a moment, in thus speaking of its Atlantic brother with reference to the testimony of the rocks as to its limit of southern range north of the equator; for the thought of herds of walrus floating down on immense frigid floes over the present low lands of Virginia and North Carolina, and of Anvers and near Paris, France, is an interesting one, relative to the features of the great ice age; down they came, that is certain. Van Beneden and Leidy have recently figured their aged bones as they are silicified or cast in the marls of those southern coasts and interiors. [See Leidy, *Trans. Am. Phil. Soc.*, xi, 1860, Philadelphia. Van Beneden: *Des de Oss. Foss. des Environs d'Anvers; Annales Mus. d'Hist. Nat. de Belgique*, 1877, tome i, pp. 40–41.] No such bones have as yet been found on the northwest coast, or in Alaska.

†When I stepped, for the first time, into the baidar of St. Paul island, and went ashore, from the "Alexander", over a heavy sea safely to the lower bight of Lukannon bay, my sensations were of emphatic distrust; the partially water-softened skin-covering would puff up between the wooden ribs, and then draw back, as the waves rose and fell, so much like an unstable support above the cold green water below, that I frankly expressed my surprise at such an outlandish craft. My thoughts quickly turned to a higher appreciation of those hardy navigators who used these vessels in circumpolar seas years ago, and the Russians, who, more recently, employed bidarrahs chiefly to explore Alaskan and Kamtchatkan *terra incognita*. There is an old poem in *Avitus*, written by a Roman as early as 445 A. D.; it describes the ravages of Saxon pirates along the southern coasts of Britain, who used just such vessels as is this bidarrah of St. Paul.

> Quin et armoricus piratim Saxona tractus
> Spirabat, cui pelle falum fulcare Britannum
> Ludus, et assuto glaucum mare findere lembo.

These boats were probably covered with either horse or bull's hides. When used in England they were known as *coracles;* in Ireland they were styled *curachs;* Pliny tells us that Cæsar moved his army in Britain over lakes and rivers in such boats. Even the Greeks used them, terming them *karabia;* and, the Russian word of *korabl'*, or "ship", is derived from it. King Alfred, in 870–872, tells us that the Finns made sad havoc among the Swedish settlements on the numerous "meres" (lakes) in the moors of their country, by "carrying their ships (baidars) overland in the meres whence they make depredations on the Northmen; their ships are small and very light".

All air-dried seal pelts, no matter whether hair- or fur-seal, sea-lion or walrus hides, are called by the Aleutians, and also by the Kamtchadales, "loughtak" or "lofftak". When the natives of Kamtchatka told Steller in 1740–'42, that the large hair-seal, *Phoca barbata*, was known to them as "loughtak", they evidently did not give him their specific name for the seal; but rather expressed their sense of its large skin, which was so highly prized by them as to be "the loughtak" of all other loughtak in those waters of their country. *Erignathus barbatus* has never been seen around or on these islands of the Pribylov group, but every air-dried fur-seal, or sea-lion skin, there, is called "loughtak" by the people.

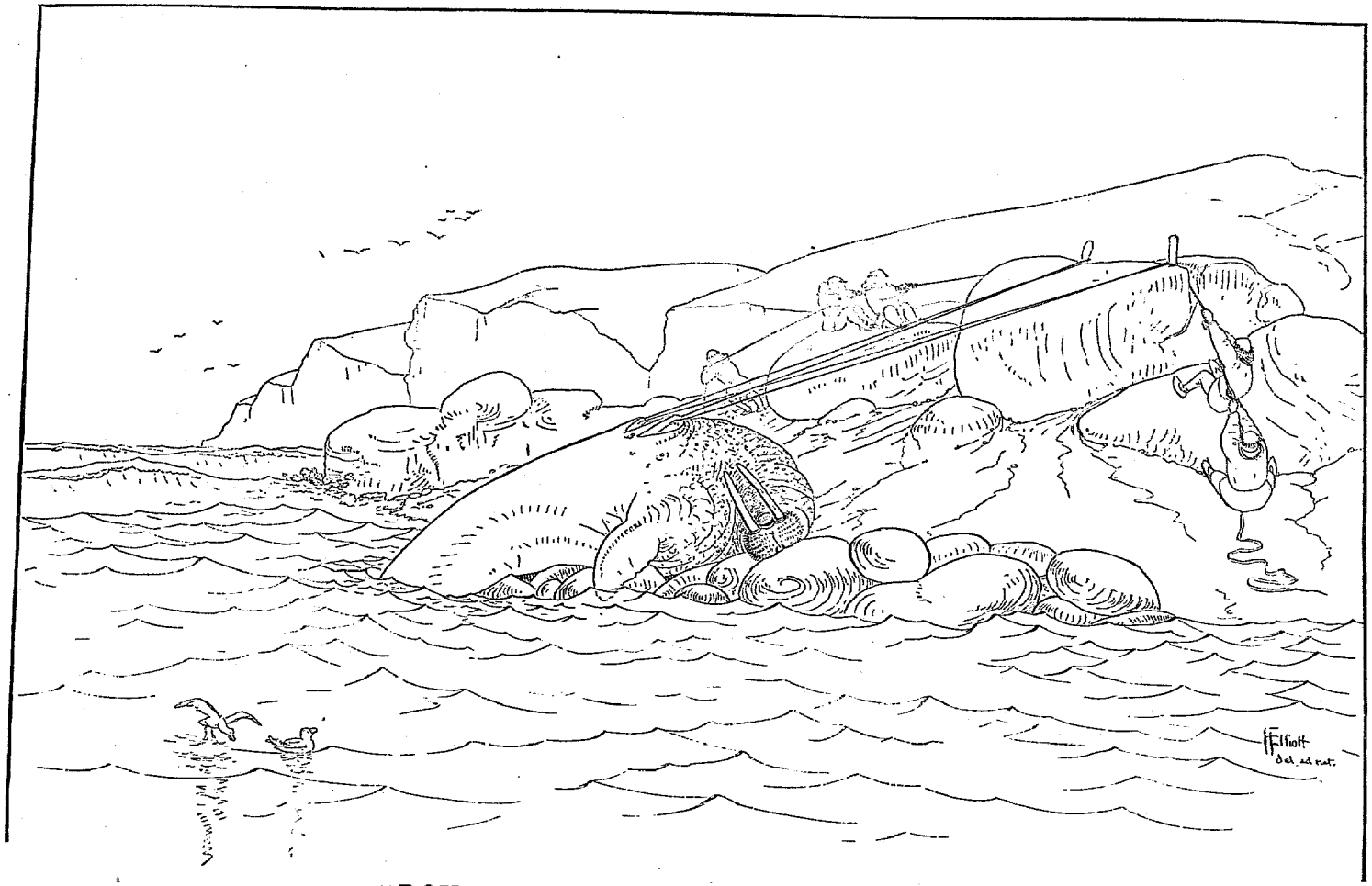
not have the luxurious spread of sea-lion steak and fur-seal hams, regard it as highly and feed upon it as steadily as we do our own best corn-fed beef. Indeed, the walrus to the Eskimo answers just as the cocoa-palm does to the South Sea islander; it feeds him, it clothes him, it heats and illuminates his "igloo"; and it arms him for the chase, while he builds his summer shelter and rides upon the sea by virtue of its hide. Naturally, however, it is not much account to the seal-hunters on the Pribylov islands; they still find, by stirring up the sand-dunes and digging about them at Northeast point, all the ivory that they require for their domestic use on the islands, nothing else about the walrus being of the slightest economic value to them. Some authorities have spoken well of walrus meat as an article of diet; either they had that sauce for it born of inordinate hunger, or else the cooks deceived them. Starving explorers in the arctic regions could relish it—*they* would thankfully and gladly eat anything that was juicy, and sustained life, with zest and gastronomic fervor. The Eskimo naturally like it; it is a necessity to their existence, and thus a relish for it is acquired. I can readily understand, by personal experience, how a great many, perhaps a majority of our own people, could speak well, were they north, of seal meat, of whale "rind", and of polar bear steaks, but I know that a mouthful of fresh or "cured" walrus flesh would make their "gorges rise". The St. Paul natives refuse to touch it as an article of diet in any shape or manner. I saw them removing the enormous testicles of one of the old bull walrus which was shot, for my purposes, on Walrus island; they told me that they did so in obedience to the wish of the widow doctress of the village, Maria Seedova, who desired a pair for her incantations.

Curiosity, mingled with a desire to really understand, alone tempted me to taste the walrus meat which was placed before me at Poonook, on St. Lawrence island; and candor compels me to say that it was worse than the old beaver's tail which I had been victimized with in British Columbia; worse than the tough brown-bear steak of Bristol bay—in fact, it is the worst of all fresh flesh of which I know; it has a strong flavor of an indefinite acrid nature, which turned my palate and my stomach instantaneously and simultaneously, while the surprised natives stared in bewildered silence at their astonished and disgusted guest. They, however, greedily put chunks, two inches square and even larger, of this flesh and blubber into their mouths as rapidly as the storage room there would permit; and, with what grimy gusto! the corners of their large lips dripping with the fatness of their feeding. How little they thought then, that in a few short seasons they would die of starvation sitting in these same igloos—their caches empty and nothing but endless fields of barren ice where the life-giving sea should be. The winter of 1879–'80 was one of exceptional rigor in the Arctic, although in the United States it was unusually mild and open. The ice closed in solid around St. Lawrence island—so firm and unshaken by the giant leverage of wind and tide, that the walrus were driven far to the southward and eastward beyond the reach of the unhappy inhabitants of that island, who, thus unexpectedly deprived of their mainstay and support, seem to have miserably starved to death, with the exception of one small village on the north shore. The residents of the Poonook, Poogovellyak, and Kagallegak settlements perished, to a soul, from hunger; nearly three hundred men, women, and children. I recall the visit which I made to these settlements, in August, 1874, with sadness, in this unfortunate connection, because they impressed me with their manifest superiority over the savages of the northwest coast. They seemed, then, to be living, during nine months of the year, almost wholly upon the flesh and oil of the walrus. Clean limbed, bright eyed, and jovial, they profoundly impressed me with their happy reliance and subsistence upon the walrus herds of Bering sea. I could not help remarking then, that these people had never been subjected to the temptations and subsequent sorrow of putting their trust in princes; hence, their independence and good heart. But now it appears that it will not do to put your trust in walrus, either.

I know that it is said by Parry, by Hall, and lately by others, that the flesh of the Atlantic walrus is palatable; perhaps the nature of food-supply is the cause. We all recognize the wide difference in pork from hogs fed on corn and those fed on beech mast and oak acorns, and those which have lived upon the offal of the slaughtering houses or have gathered the decayed castings of the sea shore; the walrus of Bering sea lives upon that which does not give pleasant flavor to its flesh.

IMPERFECTION OF WALRUS IVORY.—Touching the ivory, I was struck, in looking over the tusks as they protruded from the live animals' mouths, by the fact that only rare examples of perfect teeth could be found; they were broken off irregularly, some quite close to the socket, hardly a single animal having a sound and uniform pair of tusks. Most of the walrus ivory taken is of very poor quality; it has a deep core, or yellow, suspended pith, and is frequently so cracked, where the ivory is the whitest and the firmest, as to be of mere nominal value; but exceptional teeth now and then occur, of prodigious size and superior texture; these are carefully treasured and sold to great advantage.

THE ANTIQUITY OF WALRUS HUNTING.—Generally, when we look for the earliest records of this or that action or occupation, we are treated to a vast store of indeterminate material, upon which any theory or conjecture may be raised. But, touching the case of the hunting of the fur-seal and the walrus, in northern waters, we have exact data as to records of the earliest chase and capture of these animals by our own people. The history of walrus hunting comes down to us from rare old antiquity, in this way: Shortly after 868 A. D., King Alfred, of England, gave a translation of the Spanish *Ormestra*, or "*Di miserere mundi*," of Paul Orosius, in his mother tongue, the Anglo-Saxon; into this complete and only geographical review of the earth's form, as known at



"DOUBLE PURCHASE" OF THE ESKIMO.

Innuits of St. Lawrence Island, Alaska, hoisting a Walrus carcass.

that time, he interwove the relations of Othere and the Dane Wulfstan. The former was a great man from Norway; he undertook a voyage of discovery beyond the north cape of his native land, and to the then unknown eastward as far as our modern Finland, which he indicated as the "country of the Beormas". He shaped his course to this region, "on account of the horse whales, inasmuch as they have very good bone in their teeth"; also, "this sort of whale is much less than the other kinds, it being not larger commonly than seven ells"; and states further that he Othere, "had killed fifty-six in two days".

DESCHNEV THE FIRST TO SEE THE WALRUS OF BERING SEA.—The earliest personal record made of the walrus of Bering sea, was the discovery of these animals by Simeon Deschnev, that Cossack who, first of all civilized men, sailed through Bering straits, October, 1648; and who made use of their ivory, *en voyage*, in repairing his rude shallop. He also, in 1651, discovered extensive sand shoals north of the Anadyr mouth, upon which large herds of walrus were resting. But in this connection it is proper to say, that the walrus of Bering sea is the same animal of which Isaiah Ignatiev learned in 1646, when he led a party of Russian fur-hunters east of the mouth of the Kolyma as far as Tchaun bay. He did not see it, however, and traded with the Tschukchies for the teeth in question. His report of a nation rich in walrus ivory far to the eastward along the shores of the Polar ocean, is what stimulated the remarkable voyage of Deschnev, above referred to, as well as many others who were not so successful,* viz: Staduchin, Alexiev, Ankudinov, Buldakov, all in 1647–1649.

BOREAL RANGE OF THE WALRUS OF BERING SEA.—The range of the Bering sea walrus now appears to be restricted in the Arctic ocean to an extreme westward at Cape Chelagskoi, on the Siberian coast, and an extreme eastward between Point Barrow and the region of Point Beechey, on the Alaskan shore. It is, however, substantially confined between Koliutchin bay, Siberia, and Point Barrow, Alaska. As far as its distribution in polar waters is concerned, and how far to the north it travels from these coasts of the two continents, I am unable to present any well authenticated data illustrative of the subject; the shores of Wrangell Land were found this year (1881) in possession of walrus herds.

The Japanese seem to have known of the walrus of Bering sea, but evidently have not observed it—at least, I think so, from the testimony of their spirited drawings of this animal. They represent it with the body, the neck, and the limbs of a horse, running on camel-like feet, with an equine head, from the upper jaw of which two enormous tusks depend; it is made to gallop rather as a land- than a sea-horse. The hair-seals are very much better delineated by both Chinese and Japanese artists; and, further, no suggestion, by such means, has been made of the fur-seal by them.

The chief demand for walrus ivory first came, and still comes, from those patient, skillful Mongolian hand-carvers, who work the teeth up into a variety of exceedingly attractive articles, both useful and fanciful. Wrangell says that the Tschukchies "make long, narrow drinking vessels from the teeth", which require much time to hollow out; they are frequently sold to the Reindeer Tschukchies, who convey them to the Russians.

The walrus ivory carving of the Alaskan Mahlemoots, at Oogashik and Nushagak, in particular, is remarkably well executed; clever and even beautiful imitations of our watch chains, guards, table, and pocket cutlery, rings, bracelets, and necklace jewelry are made by them. They have earned the just reputation of being "the sculptors of the north".

PARRY'S HISTORY OF THE ATLANTIC WALRUS.—In closing here this brief biography of the walrus of Bering sea, I desire to say that the graphic and detailed account given by Sir Edward Parry, in the narrative of his third voyage to the north pole, of the manner in which the Eskimo hunt and use the walrus of Prince Regent inlet (*Odobænus rosmarus*), fitly expresses my own observations made at St. Lawrence island, among the Tschukchie Eskimo there; hence, I shall not embody them in type; my illustrations will supply the vacancy which his accurate and lengthy description alone allows.† I call attention to this economic history of the Atlantic walrus by Parry, for, in my opinion, it is written with great fidelity.

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*Allen erroneously gives the credit (on p. 172, *Hist. of N. A. Pinnipeds*) of first discovery and report of the walrus ivory of Bering sea to "the Cossak adventurer Staduchin, who found (about 1645 to 1648) its tusks on the Tschukchie coast, near the mouth of the Kolyma river. A century later, Deschnev also found large quantities of walrus teeth on the sand-bars at the mouth of the Anadyr". Michael Staduchin did not sail from the Kolyma mouth until 1649. He ventured at that time as far east probably as Cape Chelagskoi; he was obliged to return then, after getting a load of walrus teeth from the Tschukchies, but from whom he could get no meat or provision of any kind; he saw no more than his predecessor, Ignatiev, did, three years prior; in other words, he did not then see the walrus itself.

†As the natives of the Pribylov islands do not hunt the walrus, I have, in my studies of this animal, introduced the figures, method, and costumes of the St. Lawrence Eskimo, which faithfully typify the entire Alaskan people, who live largely upon the flesh of this animal. I do so, not only on account of its being wholly germane to the subject of my discussion in this monograph, but more so, as it is the first pictorial presentation of the ideas involved ever given..

H. A BRIEF REVIEW OF OFFICIAL REPORTS UPON THE CONDUCT OF AFFAIRS ON THE SEAL-ISLANDS.

19. SPECIAL INVESTIGATIONS OF LIEUT. WASHBURN MAYNARD, U. S. N.

A SYNOPSIS OF LIEUT. MAYNARD'S REPORT.—In closing this biology of the seal-life on the Pribylov islands, it it is not superfluous on my part to present to the reader a brief review of the writings which have been ordered by the government upon the condition of the subject at the islands. I have previously called attention to the fact that prior to my work in 1872 and 1874, inclusive, a singular absence of a business-like and succinct method of comprehensive information existed in the archives of the Treasury Department, which is charged by law with the absolute control of these interests, and is responsible to Congress for the same. In order, therefore, that this statement of mine shall not pass as a mere assertion on my part, I deem it due to the history of the subject of this memoir, at the present writing, to give a brief abstract of the labors of those officials of the government who have made the fur-seals of Alaska the thesis of their publications and correspondence. These papers are so scattered that a combination here of their substance may not be uninteresting. I shall comment only upon those documents which have a direct reference to the Pribylov islands.

SPECIAL REPORT OF LIEUT. WASHBURN MAYNARD, U. S. N.—Before touching upon the special labors of the treasury officials, I wish to direct the attention of the reader to the following synopsis of an exceedingly concise and interesting contribution to the subject of the business on the seal-islands. It is from the pen of Lieut. Washburn Maynard, U. S. N., and was submitted by him to the Secretary of the Navy on the 30th of November, 1874. His work of investigation was in obedience to the order of Congress expressed in an act approved April 22, 1874. The occasion of this gentleman's labor arose directly from the constant and reiterated charges, made more by insinuation than by specific writing, against the correctness of my published position in regard to the conduct of the business on the seal-islands, and he proceeded to that field of duty conscious of the fact, and determined to settle it as far as he was able to, by a thorough and personal scrutiny of the whole subject. He did so; and I now desire to embody the substance of his communication above referred to.

The only fault which can be found with Lieutenant Maynard's report is, that it is exceedingly brief, though explicit. I should say here that he evidently did not consider this writing, from which I shall quote, more than a simple statement of fact, and made it in the nature of an answer to the order of a superior officer.

20. SYNOPSIS OF LIEUT. MAYNARD'S INVESTIGATIONS.

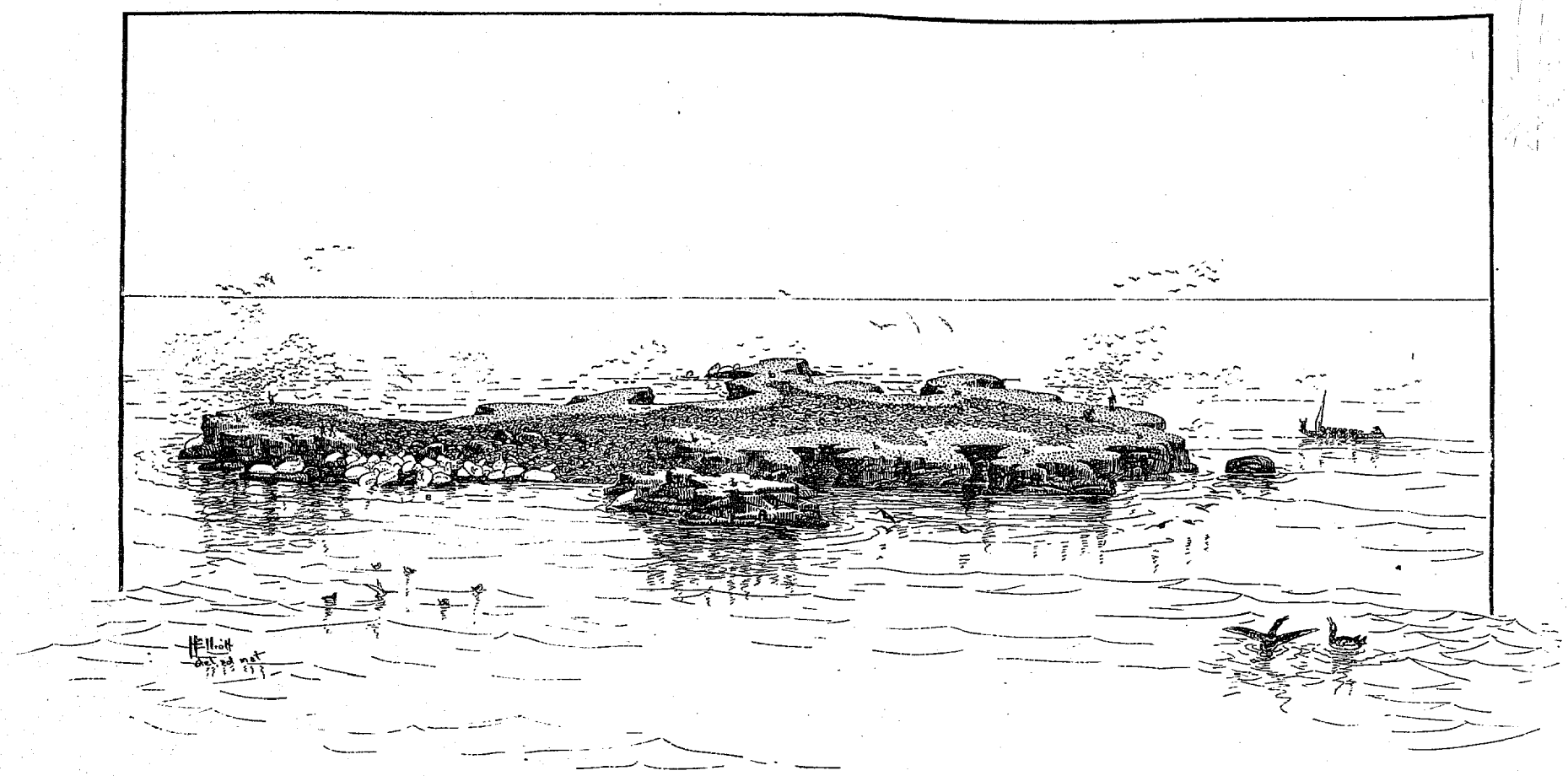
THE SUBSTANCE OF LIEUT. MAYNARD'S REPORT.—The islands of St. Paul and St. George, or the seal-islands, as they are more commonly called, are the principal ones of the Pribylov group; the other two, known as Otter and Walrus, are merely outlying islets. They are situated in Bering sea, between the parallels of 56° to 58° of north latitude and 169° to 171° of west longitude. St. Paul has an area of 33 square miles, while St. George claims but 29, with, respectively, 42 and 29 miles of shore-line each.

CLIMATE.—They are enveloped in summer by dense fogs, through which the sun rarely makes its way, and are surrounded in severe winters by fields of ice driven down by the Arctic winds. They have no sheltered harbors beyond slight indentations in the shore-line that afford a lee for vessels and tolerable landing places for boats when certain winds are blowing.

SHORES AND VEGETATION.—The shores are bold and rocky, with strips of sand-beach, and are covered by broken rocks at intervals between them. The interior of both islands is broken and hilly; neither tree nor shrub grows upon them, but they are clothed with grass, moss, and wild flowers. For nearly one hundred years fur-seals have been known to visit them annually in great numbers for the purpose of bringing forth and raising their young, which circumstance gives those islands their great commercial importance.

HABITS OF THE SEAL.—These seals occupy the islands from the breaking away of the ice in the spring until it surrounds their coasts again in early winter, that is, from the middle of May until December. In milder hyemal seasons, when there is little or no ice about the islands, a few seals have been seen swimming around in the water throughout the entire year, but these exhibitions rarely occur. The fur-seals are not known to haul up on land elsewhere within the limits of the North Pacific ocean, except at Bering and Copper islands, lying in Bering sea near the Asiatic coast, and Robbin's reef, a small rock on the coast. They certainly go from those landing places to the southward in the fall, for they are frequently seen in the sea, either solitary or in shoals of thousands, and are killed in the water all the way from Sitka to the straits of Fuca. In 1833, 54 were taken by the Russians on the Farralone islands, off seaward from the entrance to the bay of San Francisco. There seems to be no reason why they cannot remain in the water during the entire time they are absent from the islands, for they eat their food there at all times, and are able to sleep upon its surface.

CLASSIFICATION OF THE SEALS.—They may be divided into two classes, the breeding and the non-breeding seals; the former comprise the full-grown males or bulls, the adult females or cows, and their young or pups; the



WALRUS ISLET.

Showing the Walrus as it herds, and the peculiar zones of breeding-birds.

A. Cliff fronts occupied by the Rissa and Kittiwake gulls, and the cormorant (*Rissa brevirostris*, *Larus tridactylus*, and *Graculus bicristatus*). b b b. Plateau belt covered by the Arries (*Lomvia arra*) to the exclusion of all other water-fowl. It is white with the droppings of these birds. c c c. The grassy interior, occupied chiefly by the Burgomaster gull (*Larus glaucus*), and a few *Rissa* and *L. tridactylus*). d. Rocky shingle and loose surf-thrown bowlders, between and in the chinks of which the Auks and Puffins nest. e. Walrus herds on the "Echouries."

latter embrace the young or bachelor males and the yearlings of both classes. Each of these classes leave the water and haul up along the shores of the islands nearly in juxtaposition to each other as they are massed on the land, but they are entirely separate. They choose certain portions of the shore to the exclusion of the rest, not all of any one class being together, but spreading into many communities, which are often several miles apart.

POSITION OF THE BREEDING-ROOKERIES.—The breeding seals occupy a slip of ground, between the cliffs, which is covered with bowlders and broken rocks, beginning a few feet above high-water mark, and extending back over a depth of from 50 to 200 feet in a compact and uniform mass. Such places are called breeding-rookeries.

POSITION OF THE HAULING-GROUNDS.—The non-breeding seals, on the contrary, are scattered over the sand. beaches and the higher ground in the rear without any regular order of distribution. When these hauling-grounds lie to the rear of the breeding-grounds, as they sometimes do, pathways are left open in the rookeries at convenient points, to allow a passage up from the sea and back thereto, for the non-breeding seals.

NUMBER OF ROOKERIES.—There are 7 rookeries on St. Paul island, extending with the adjacent hauling-grounds over one-third of its shore-line, and on St. George island there are 5 breeding places and hauling reaches, which, however, take up less than one-tenth of its coast. These breeding-grounds are re-occupied each year with but little change.

DESCRIPTION OF THE LANDING OF THE SEAL.—About the middle of May, usually, the bulls, which are the first of the breeding-seals to arrive, crawl from the water and establish the rookeries in readiness for the cows that begin to come somewhat later. It seems probable that the rookeries are occupied by the same bulls and cows from year to year, as they, the rookery grounds, change but little, either in size or form; but it has been proven that the bachelors do not return to the same hauling-grounds, or even to the same island, with regularity from year to year. The time of arrival of cows is governed by their period of gestation, as they do not appear on the rookeries until within a short time of giving birth to their pups. Hence all do not come at the same period, but arrive continuously from the last days of May until the middle of July.

POLYGAMOUS AND ANGRY NATURE OF THE MALES.—The bulls are polygamous, having from 20 to 50 cows each, so the number of them upon the rookeries is not more than one-tenth of that of the cows. They have frequent and bloody fights for the possession and retention of their places upon the breeding-grounds, and for control of the cows, in which they are often killed, or are driven from the rookeries, and are more or less badly bitten by the sharp teeth of their opponents. The females do not even always escape unhurt, as two males seize one and literally tear her in two by their struggle for her possession.

ARRIVAL OF THE FEMALES AND BIRTH OF THEIR YOUNG.—The cows are continuously arriving upon the rookeries and giving birth to their pups, from the last of May until the middle of July. Usually each female bears a single pup, though I have been told by persons, whose statement I have no reason to doubt, that they have witnessed one or two instances of twins. From the 20th to the 25th of July the rookeries are fuller than at any other time during the season, as the pups have all been born, and all the bulls, cows, and pups remain within these limits.

PROTRACTED FASTING OF THE MALES.—During the breeding-season, which lasts three consecutive months, or nearly so, the bulls remain upon the rookeries, never leaving them for an instant, even to procure food. This fast, and the constant watchfulness necessary to keep their harems together, and to prevent the encroachments of other bulls, and the service of the cows, renders their position no sinecure. Their emaciated bodies and loose and wrinkled skins at the close of the season are in marked contrast to the fat, sleek-looking cows, for the latter have been constantly going and coming between the rookeries and the water, so that at any one time there are seldom more than one-half of the females on land.

CHANGES AT THE CLOSE OF THE SEASON.—About the first of August the breeding-season ends, and the pups, which grow rapidly, now are large and strong enough to move about, so that the rookeries begin to lose their compact form and rigid exclusiveness. The bulls begin to go into the water, their places being filled by the younger males, which up to this time have not been allowed by the older males to go upon the rookeries, while the cows and pups spread back over the haulings in scattered groups, and occupy more than twice the space that had previously held them.

ARRIVAL AND LANDING OF THE BACHELOR SEALS.—Meanwhile the young males or bachelor seals have been coming to the hauling-grounds, which are covered more or less thickly by them all summer. They do not remain on shore long at any one time, but haul up to sleep and play for awhile, and then return to the water for food. They are so numerous, however, that thousands can always be seen upon the hauling-grounds, because all of them are never either on shore or in the water at the same time. The yearling seals, distinguished by their size, and the silvery color of their sides and abdomens, do not make their appearance until the latter part of July; then they arrive together in a great body, males and females, and go out upon the hauling-grounds in large numbers and play one with the other for hours at a time. The bachelors join them in their sport, and singling out the baby cows form mimic rookeries, and imitate the roaring, fighting, and caressing of the bulls in a ludicrous manner.

SHEDDING OF THE PUPS AND THEIR LEARNING TO SWIM.—In September and October the pups exchange their coat of black hair, which has been their only covering from their birth, for one of fur and hair combined, similar in appearance to that of the yearling, and then begin to learn to swim, so as to be ready for their departure

from the islands in November and December. Prior to this period many of them are killed by the surf, especially if the season be a stormy one, since they are not strong enough swimmers or expert enough to save themselves from being dashed against the rocks by the heavy rollers. The cows remain with their pups and suckle them, until all classes have left the islands, usually by the 1st or 10th of December. It is probable that of all the seals born each year an aggregate of about one half are males. The experiment was tried of examining one hundred pups, taken at random from the rookeries, and in that number the sexes were about equally divided. The number of bachelor seals in proportion to the cows would also seem to confirm the supposition.

CHARACTERISTIC CHANGES OF THE PELAGE.—There is not the slightest perceptible difference in appearance between the seals of the two classes, either in the first or in the second year after their birth, but as they grow older they vary and diverge in the tinting of their coats, so as to be readily determined each from the other. The pups when born have only short black hair, no fur. This coat is gradually replaced in their first year by a dress of fine elastic fur, of a light buff color, and of hair longer than the fur, so as to cover it completely and give that silvery-gray to their sides and bellies, and that dark gray characteristic of their necks and heads. The color of their hair changes in their second year to a uniform dark gray. In their fifth year the hair upon the neck and shoulders of the males begins to grow coarser and longer, forming a sort of mane, which increases in length and stiffness until the animal attains its full growth, during the lapse of its eighth or ninth year of life. The females are not found upon the hauling-grounds with the males after they are two years old, hence it seems probable that they go from the rookery in their third, and bear a pup in their fourth year. When both are full grown the sexes differ most widely in appearance; the male, weighing from four to five hundred pounds, is about three times as large as the female, has a mane, and is either black or dark brown in color. The tinting of the female is a soft, rich brown on the back and sides, changing almost to orange upon the belly, and there is no mane. The fur of the cows is rather thicker and finer than that of the yearling seals, though the skins of young males from three to six years old are not very much inferior.

IMPORTANCE OF KNOWING THE NUMBER OF SEALS.—It is of very great significance in this connection to know how many seals come annually to the islands, or rather to understand how many may be killed for their skins annually, without causing less to come hereafter than do at the present time. To determine how many there are with accuracy is a task almost on a par with that of numbering the stars. The singular motion of the animals when on shore, the great variety in size, color, and position; the extent of surface over which they are spread, and the fact that it cannot be determined exactly what proportion of them, of their several classes, are on shore, at any given time; all these desiderata for comprehension make it simply impossible to get more than an approximation of their numbers. They have been variously estimated at from one to fifteen millions.

METHODS OF ENUMERATION OF THE FUR-SEAL.—I think the most accurate enumeration yet made is that by Mr. H. W. Elliott, special agent of the Treasury Department, in 1872. This calculation is based upon the hypothesis that the breeding-seals are governed in hauling by a common and invariable law of distribution, which is, that the area of the rookery ground is directly proportional to the number of seals occupying it. He estimates that there is one seal to every two square feet of rookery surface. Hence the problem is reduced to the simple operation of obtaining half the sum of the superficial area of all the rookeries in square feet. He surveyed these breeding-grounds of both islands in 1872 and 1873, when at their greatest limit of expansion, and obtained the following results: Upon St. Paul island there were 6,060,000 feet of ground occupied by 3,030,000 breeding-seals and their young. On St. George island he announced 326,840 square feet of superficial rookery area occupied by 163,420 breeding-seals and their young; a total for both islands of 3,193,420 breeding-seals and their young. The number of non-breeding seals cannot be determined in the foregoing manner, as they haul most irregularly, but it seems to me probable that they are nearly as numerous as the other class is. If so, it would give not far from 6,000,000 as the stated number of seals of all kinds which visited the Pribylov islands during the season of 1872.

GENERAL ACCURACY OF THESE RESULTS.—It is likely that these figures are not far from the truth, but I do not think it necessary myself to take into consideration the actual number of seals in order to decide the question of how many can be taken each year without injury to the fishery. The law that the size of the rookeries varies directly as the number of seals increases or diminishes, seems to me, after close and repeated observation, to be correct. All the rookeries, whether large or small, are uniform in appearance, alike compact, without waste of space, and never crowded. Such being the case, it is unimportant to know the actual number of seals upon the rookeries. For any change in the number of seals, which is the point at issue, increases or decreases in size, and the rookeries taken collectively, will show a corresponding increase or decrease in the number of breeding-seals; consequently changes in the aggregate of pups born annually upon which the extent and safety of the fisheries depends, can be observed accurately from year to year by following these lines of survey.

SURVEYED PLATS OF THE ROOKERIES.—If, then, a plan or map of each rookery be made every year, showing accurately its size and form, when at its greatest expansion, which is between the 10th and 25th of July annually, a comparison of this map will give the relative number of the breeding-seals as they increase or diminish from year to year. I submit with this report maps of St. Paul and St. George islands, showing the extended location of breeding-rookeries, and hauling-grounds upon them. These maps are from surveys made in July, 1874,

by Mr. Elliott and myself, and a map of each rookery on both islands drawn from careful surveys made by Mr. Elliott in 1872, show them now as they were in the season of 1874 as compared with that of 1872. I respectfully recommend that enlarged copies of these latter maps be furnished to the government agents in charge of the islands, and that they be required to compare them each year with the respective rookeries, and note what change in size and form, if any, exists upon them. This, if carefully done, will afford data, after a time, by which the seal fisheries can be regulated with comparative certainty, so as to produce the greatest revenue to the government, without injury to this valuable interest.

NUMBER OF SEALS KILLED.—Since 1870 there have been killed, on both islands, 112,000 young male seals each year. Whether this slaughter has prevented the seals from increasing in numbers or not, and, if so, to what extent, can only be deduced from their past history, which unfortunately is very imperfectly given. In 1836 to 1839 there were fewer seals upon the islands than had ever been seen before since their first discovery in 1786. On St. Paul island, then, there were not more than twelve or fifteen thousand of all kinds. The killing of them was then stopped, and not resumed until 1845, when it was done gradually, and, as had never been the case before, only the young males were killed. The rookeries continued to increase in size until 1857, since which time they have remained in about the same aggregate, although a less number of bachelor seals were killed yearly between 1857 and 1868 than have been slaughtered since.

THOUGHTS ON THEIR INCREASE AND DIMINUTION FOR THE FUTURE.—This would seem to show that there is a limit beyond which they will not increase, and that this limit, a natural one, has been reached. If they could be under our control and protection at all times, and if a sufficient supply of food for them could be procured, we would doubtless be able to cause them to multiply, for there are more of both sexes born each year than are necessary to meet the losses from the natural causes of death, such as old age, diseases, and accidents, and, in reality, we do not even know where they are and what they are about for seven months in each year, while we do know that they have deadly enemies, which make sad havoc, particularly among the pups and yearlings, inasmuch as a single killer-whale has been found to have as many as 16 young seals in its stomach, when destroyed and opened for examination.

THE EXTENT OF HUMAN PROTECTION.—Our protection of them can only be partial; that is to say, we can limit the number to be killed when they are within our reach, and prevent their being dispersed on the breeding rookeries, or driven from the islands. On the other hand, the question raised is, whether the killing of the number above mentioned has had, or has not had, the effect of decreasing the aggregate number of seals. Judging from the comparison between the maps of the rookeries as they were in 1872, and the condition of the rookeries themselves as surveyed, and from the testimony of the best informed men on the island, both whites and natives, I think it has not as yet. Since the young males alone are killed, injury would be effected through this action, if it did not allow a sufficient number to reach that maturity necessary for the satisfaction of all demands of the breeding females on the rookeries. The young males do not grow strong enough to reach the rookeries until they are at least six years old; hence, the effect of the first year's killing cannot be seen in that connection until the pups have attained this age. For that reason it seems to me that it is now a little too soon to decide whether we are killing too many or not, since the present conduct of affairs has now been only four years in operation. It is possible, however, that more, even twice as many as are now killed annually, might be taken every year without injury, but it would be making a severe and most hazardous experiment before any definite result has been obtained from the first, which is now in operation. The number now killed annually is entirely experimental, because we have nothing to start from in the past as a basis of estimation for the future until the effect produced is satisfactorily shown. I would, therefore, not recommend an extension of the contract as to the number of seals to be killed until within seven or eight years from the date of the one now existing went into effect, when, if the rookeries have not decreased in size, it can then safely be done.

THE LEASE OF THE ISLANDS.—In June, 1870, Congress passed an act entitled "An Act to prevent the extermination of the fur-bearing animals in Alaska", which authorized the Secretary of the Treasury to lease to private parties for a term of years the right to engage in the business of taking fur-seals on the islands of St. Paul and St. George, under certain specified conditions and restrictions. Therefore, the subject was publicly advertised, and bids solicited, the privilege to be awarded to the highest responsible bidder. A number of individuals doing business in San Francisco under the firm-name of the "Alaska Commercial Company" were the successful bidders, and the right was granted to them under the terms of the lease now in force (a copy of which is here annexed) for a period of twenty years, from the 1st day of May, 1870. The terms were not arranged and the lease delivered until the 31st day of August, 1870, and the vessels and agents of the company did not reach the islands until the 1st of October. The season allowed by law for killing seals being nearly over, but few skins, consequently, were taken by the company that year (3,448 on St. Paul, and 5,789 on St. George island). But the following and each succeeding year they have taken nearly the full number.

When the lease was made it was erroneously supposed that there were about one-third as many seals on St. George island as there were on St. Paul, and, in consequence of this understanding, the number to be taken from each island was fixed at 25,000 and 75,000 respectively. In reality there are only about one-eighteenth as many on the former as on the latter, which fact having been clearly shown by Mr. Elliott, the power was given to the

Secretary of the Treasury by Congress to change the ratio on each island to a correct basis. In consideration of being the only company allowed to take fur-seals on the islands, it has agreed to pay a yearly rental for the use of them, and a tax or duty upon each skin taken and shipped from them; not to kill more than the stipulated number of seals, and seals of a particular kind; not to molest them on the rookeries or in the water, and to do nothing which would tend to frighten them from the islands, to provide for the comfort, maintenance, education, and protection of the native inhabitants, and neither to furnish nor allow any of its agents to use distilled spirits or spirituous liquors, or to supply them to any of the natives.

EMPLOYÉS OF THE ALASKA COMMERCIAL COMPANY.—The company employs on St. Paul an agent who has general charge of the business on both islands, three assistants, a physician, a school teacher, three carpenters, a cooper, a steward, and a cook; and on St. George, an agent, a physician, a school teacher, and a cook.

CONDUCT OF THE SEALING.—The great work of the season, the taking and curing of seal-skins, begins the first week in June, and is pushed forward as rapidly as possible, as the skins are in the best condition early in the season. This year 90,000 skins were taken on St. Paul by eighty-four men in thirty-nine days. The natives do all the work of driving, killing, and skinning the seals, and of curing and bundling the skins, under the direction of the company's agents and of their own chiefs. The first operation is that of driving the seals from the hauling- to the killing-grounds. The latter are near the salt-houses, which are built at points most convenient for shipping the skins, and all the killing is done upon them, in order not to disturb the other seals, and to save the labor of carrying the skins. The seals suitable for killing (which are the young males from two to six years old) are readily collected into droves upon the hunting-grounds by getting between them and the water, and are driven as easily as a flock of sheep. They move in a clumsy gallop, their bellies being raised entirely from the ground, upon their flippers, which gives them, when in motion, the appearance of bears. They are sometimes called "sea-bears" on account of this resemblance. In driving them care is taken not to hurry them, for if driven too fast they crowd together and injure the skins by biting each other, and also become overheated and exhausted. They are driven from one-half mile to five miles in from three to thirty-six hours, according to the location of the hauling-grounds. After reaching the killing-grounds they are allowed to rest and cool for several hours, particularly if the drive has been a long one. The drives vary in number from five hundred to as many thousand, as there happen to be few or many seals upon the hauling-ground where the drive is made. In each drive there are some seals that are either so large or so small that their skins are not desirable, and sometimes a few females are driven up, not often, however, as they seldom stray from the rookeries. All such are singled out and permitted to escape to the water. The killing is done with a blow on the head by a stout club, which crushes the skull, after which the skins are taken off and carried into the salt-houses. During the first half of the month of June, from five to eight per cent. of the seals in the drive are turned away, being either too small or too large, and from ten to twelve per cent. during the latter half. In July the percentage is still greater, being about forty per cent. for the first and from sixty to seventy-five per cent. for the latter half. About one-half the seals killed are about three years old, one-fourth four, and the remainder two, five, and six. No yearlings have been killed up to the present time, though allowed by the lease, as their skins are too small to be saleable in the present state of the trade, but by some change in it they may become desirable in the future and would then be taken. This would, however, injure the fisheries, because the yearlings of both sexes haul together, and it would be almost impossible to separate them so as to kill only the males. There has been a waste in taking the skins, due partly to the inexperience of the company's agent, and partly to accident and the carelessness of the natives. In making the drive, particularly if they are long, and the sun happens to pierce through the fog, some of the seals become exhausted and die at such a distance from the salt-houses that their skins cannot well be carried to them by hand, and are therefore left upon the bodies. This was remedied during the last killing-season, by having a horse and cart to follow the drive and to collect such skins. Some skins have also been lost by killing more seals at a time than the force of men employed could take care of properly. Good judgment and constant care are required in taking the skins, as fifteen minutes' exposure to the sun will spoil them, by loosening the fur. Another source of waste is by cutting the skins in taking them off in such a manner as to ruin them. It was very difficult at first to induce the natives to use their knives carefully, and several hundred skins were lost in a season by careless skinning; but by refusing to accept and pay for badly-cut skins, the number has been greatly reduced, so that the loss this year on St. Paul was but one hundred and thirty from all causes. The salt-houses are arranged with large bins called kenches, made of thick planks, into which the skins are put, fur-side down, with a layer of salt between each two layers of skins. They become sufficiently cured in from five to seven days, and are then taken from the kenches and piled up in "books", with a little fresh salt. Finally they are prepared for shipment by rolling them into compact bundles, two skins in each, which are secured with stout lashings. The largest of these bundles weigh sixty-four pounds, but their average weight is but twenty-two. The smallest skins, those taken from seals two years old, weigh about seven pounds each, and the largest, from seals six years old, about thirty.

COUNTING THE SKINS.—The skins are counted four times at the island, as follows: by the company's agent and the native chiefs when they are put into the salt-houses, the latter giving in their accounts, after each day's killing, to the government agent; again when they are bundled by the natives, who do the work, as each is paid for his labor by the bundle; by the government agents when they are taken from the salt-houses for shipment, and the

fourth time by the first officer of the company's steamer, as they are delivered on board. An official certificate of the number of skins shipped is made out and signed by the government agents in triplicate, one copy being sent to the Treasury Department, one to the collector of San Francisco, the third given to the master of the vessel in which they are shipped. The amount of the tax or duty paid by the company to the government is determined by the result of a final counting at the custom-house in San Francisco. The books of the company show that it has paid into the treasury since the date of the lease (up to the present writing, November 30, 1874),$170,480 54 on account of the rental of the islands, and $1,057,709 74 as tax on the seal-skins taken. The latter sum is less by $16,458 63 than the tax that should have been paid had one hundred thousand skins been taken each year since 1870, or, in other words, 6,269 fewer skins have been shipped than the law permitted. The record kept at the islands by both the government's and company's agents shows that in 1871 but 19,077 skins were taken from St. George instead of 25,000, the legal number allowed, and that every year since the number shipped has fallen a little short of 100,000.

POLICY OF THE ALASKA COMMERCIAL COMPANY.—The company has wisely adopted a fair and liberal policy in its dealings with the natives, and is more than repaid for the expense incurred by the increased ease and rapidity with which they work while taking skins. I examined carefully the books and papers of the company, both at its office in San Francisco and upon the island; also the record kept by the government agents, and talked privately with the most intelligent of the natives, but I was unable to discover by so doing that there has been any fraud practiced toward the government, or want of compliance with the terms of the lease. The natives keep a jealous watch upon the seals, being fully impressed with the fact that their welfare depends upon the safety of the fisheries, and they are also well informed in regard to all laws and contracts which have been made by the government concerning them.

TREATMENT OF THE NATIVES BY THE COMPANY.—The lease requires that provision be made by the company for the comfort, maintenance, education, and protection of the native inhabitants of the islands.

The natives do all the work of taking and curing the seal-skins, for which they are paid by the company forty cents a skin. This produces each year a fund of $40,000, which is divided between the inhabitants of the two islands, according to the number of skins taken from each, which gives $30,000 to the people of St. Paul, and $10,000 to those of St. George. In addition to this, they are paid forty cents apiece for sea-lion skins, ten cents for their throats, and $5 a barrel for their intestines. As this sum is earned by the joint labor of all the able-bodied men, it is considered a common fund, to be divided equitably among them. Payment is made for all other labor to each individual performing it at established rates. In dividing the sealing fund, the ability of the sealers is considered, and the division made accordingly. Thus the strongest and most skillful men, who work the entire season, receive a first class share. Those who are less skillful, and the old men who are unable to do the harder part of the work, receive second and third shares, while the boys who take part in the sealing for the first time receive a fourth class share. The assignment of shares is made by the chiefs and acquiesced in by the others. Each year, after all the skins have been taken, the chiefs furnish the company's agents with a list of the men who have been engaged in sealing during the season, and the share assigned to each. The second, third, and fourth class are, respectively, 90, 80, and 70 per cent. of the first class share. Two first class shares are voluntarily given for the support of the church, and one for that of the priest. The value of the shares varies a little from year to year, with the number of men engaged in sealing. This year (1874) it was for each, respectively, $429 53, $368 58, $343 62, and $300 63. The result of the division is formally made to the people by the company's agents, through the chiefs and in the presence of the government's agents. These sums are not paid at the time to the natives, but are placed to their credit in the book of the company and in pass-books which are furnished to each man. All other labor is paid for in coin when performed, at the rate of from 6 to 10 cents an hour, according to the nature of the work, except that of bundling skins, which is at the rate of 1 cent a bundle. The first chief is paid a monthly salary of $15, and each of the others, three in number, one of $10, in addition to their shares of the sealing fund. Other natives, men and women, employed throughout the year in other capacities, receive from $4 to $30 a month and board.

THE COMPANY'S STORE.—Clothing, provisions, and other articles are kept in the company's store-houses on the island, and are sold to the natives at prices not exceeding those for which the same could be bought at retail in San Francisco. I examined the goods, and found them to be of good quality. The people have but little idea of economy, and would spend all their money in a short time for certain articles of which they are fond, hence it is necessary to limit their sale, such as butter, sugar, and perfumery. They are encouraged to save money by the company, which receives deposits from them, subject to the usual rules of "savings banks", and pays an interest of 9 per cent. per anuum. Deposits range from $100 to $1,100. The church has a deposit of $8,000. Some are in debt to the company, but become less so every year. Such as are without means of support, widows and orphan children, are supported by the company.

SANITARY ADVANCEMENT.—The natives live partly in "barrabaras," or earth-houses, and partly in comfortable frame-houses. Thirty of the latter have been built within the last two years by the company, and given rent free. Others are being built as rapidly as possible, it being the intention of the company to give each family a house. The lease requires the annual delivery upon the island of sixty cords of fire-wood, and twenty-five thousand dried

salmon, for the use of the natives; but, with the consent of the Secretary of the Treasury, coal, ton for cord, has been substituted for the former, and an equivalent quantity of salted salmon and codfish for the latter. Both have been regularly supplied, as shown by the receipts of the government agent and the statements of the natives, together with as much salt and as many barrels as have been desired for curing and storing their seal-meat.

Two physicians are in the employ of the company, one residing on each island, who are charged with the care of the sick, and have already, by their efforts, seconded by the example of the other white residents, induced greater cleanliness and a more healthful mode of living among the natives.

SCHOOL ATTENDANCE.—The education of the native children has not been neglected, though so far the attempt to teach them has not been as successful as could be desired. For each island a competent teacher, a convenient and well-warmed school-room, and a supply of school-books, etc., have been provided every year from the first of October until the first of June, but the difficulty has been to induce the parents to send their chidren, as they do not think them able to learn both English and Russian, and as the latter is the language of their church they consider it the most important. The average attendance at the school on St. George has been but five or six, while there are from thirty to forty children, and on St. Paul but four or five, with from forty to fifty children. Last year on the latter island there was a better attendance, and the children made considerable progress. The prejudice of the older people seems likely to wear away, as they learn a little English themselves from constantly hearing it, and will doubtless disappear after a time.

TERMS OF THE SEAL-ISLAND LEASE FROM THE GOVERNMENT.—This indenture in duplicate, made this 3d day of August, A. D. 1870, by and between William A. Richardson, Acting Secretary of the Treasury, in pursuance of an act of Congress approved July 1, 1870, entitled "An act to prevent the extermination of fur-bearing animals in Alaska," and the Alaska Commercial Company, a corporation duly established under the laws of the state of California, acting by John F. Miller, its president and agent, in accordance with a resolution at a meeting of its board of trustees, held January 31, 1870, witnesseth:

That said secretary hereby leases to the said Alaska Commercial Company, without power of transfer, for the term of twenty years from the 1st day of May, 1870, the right to engage in the business of taking fur-seals on the islands of St. George and St. Paul within the territory of Alaska, and to send a vessel or vessels to said island for the skins of such seals.

And the said Alaska Commercial Company, in consideration of their right under this lease, hereby covenant and agree to pay, for each year during said term and in proportion during any part thereof, the sum of $55,000 into the Treasury of the United States in accordance with the regulations of the secretary to be made for this purpose under said act, which payment shall be secured by deposit of United States bonds to that amount, and also covenant and agree to pay annually into the Treasury of the United States, under said rules and regulations, an internal-revenue tax or duty of $2 for each seal-skin taken and shipped by them in accordance with the provisions of the act aforesaid, and also the sum of 60¼ cents for each fur-seal skin taken and shipped, and 55 cents per gallon for each gallon of oil obtained from said seals, for sale in said islands or elsewhere, and sold by said company; and also covenant and agree, in accordance with said rules and regulations, to furnish, free of charge, the inhabitants of the islands of St. Paul and St. George annually during said term 25,000 dried salmon, 60 cords fire-wood, and a sufficient quantity of salt and a sufficient quantity of barrels for preserving the necessary supply of meat.

And the said lessees also hereby covenant and agree during the term aforesaid to maintain a school on each island, in accordance with said rules and regulations and suitable for the education of the natives of said islands, for a period of not less than eight months in each year.

And the said lessees further covenant and agree not kill upon said island of St. Paul more than seventy-five thousand fur-seals, and upon the island of St. George not more than twenty-five thousand fur-seals per annum; not to kill any fur-seal upon the islands aforesaid in any other month except the months of June, July,, September, and October of each year; not to kill said seals at any time by the use of fire-arms or means tending to drive said seals from said islands; not to kill any female seals or seals under one year old; not to kill any seal in waters adjacent to said islands, or on the beach, cliffs, or rocks, where they haul up from the sea to remain.

And the said lessees further covenant and agree to abide by any restriction or limitation upon the right to kill seals under this lease that the act prescribes, or that the Secretary of the Treasury shall judge necessary for the preservation of such seals.

And the said lessees hereby agree that they will not in any way sell, transfer, or assign this lease, and that any transfer, sale, or assignment of the same shall be void and of no effect.

And the said lessees further agree to furnish to the several masters of the vessels employed by them certified copies of this lease, to be presented to the government revenue officers for the time being in charge of said islands, as the authority of said lessees for the landing and taking of said skins.

And the said lessees further covenant and agree that they or their agents shall not keep, sell, furnish, give, or dispose of any distilled spirituous liquors on either of said islands to any of the natives thereof, such person not being a physician and furnishing the same for use as medicine.

And the said lessees further covenant and agree that this lease is accepted, subject to all needful rules and regulations which shall at any time or times hereafter be made by the Secretary of the Treasury for the collection and payment of the rental herein agreed to be paid by said lessees for the comfort, maintenance, education, and protection of the natives of said islands, and for carrying into effect all the provisions of the act aforesaid, and will abide by and conform to said rules and regulations.

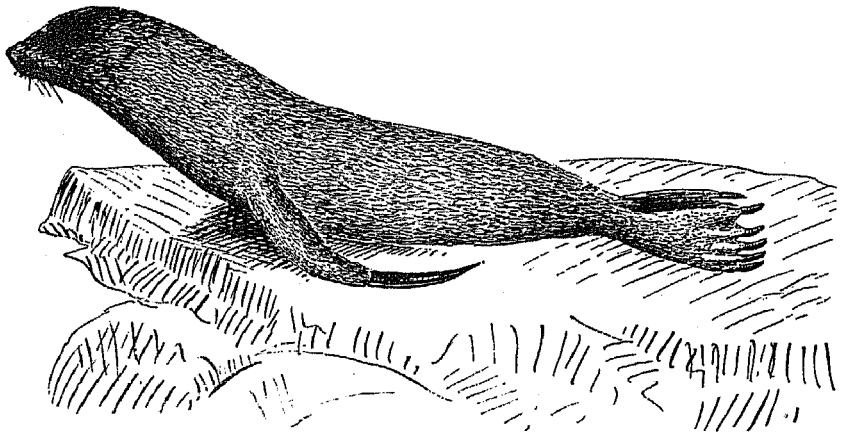
And the said lessees, accepting this lease with a full knowledge of the provisions of the aforesaid act of Congress, farther covenant and agree that they will fullfil all the provisions, requirements, and limitations of said act, whether herein specifically set out or not.

In witness whereof the parties aforesaid have hereunto set their hands and seals the day and year above written.

WILLIAM A. RICHARDSON, [SEAL.]
Acting Secretary of the Treasury.

Executed in presence of—
J. H. SAVILLE.

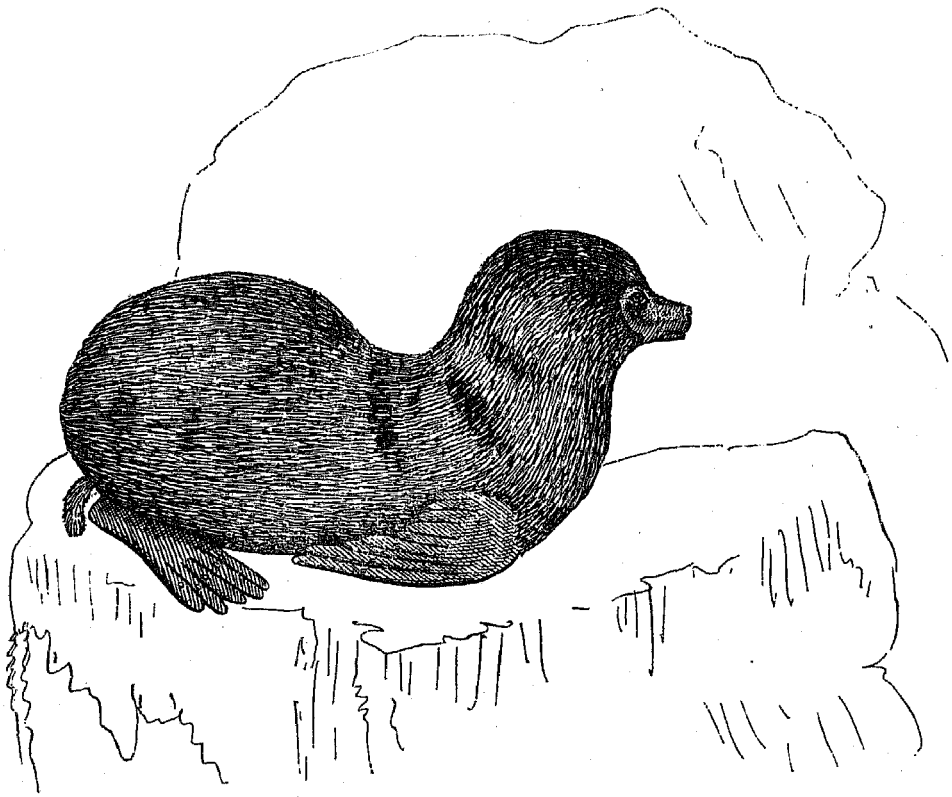
ALASKA COMMERCIAL COMPANY,
By JOHN F. MILLER, *President.* [SEAL.]



A FUR-SEAL, as drawn by C. Landseer, 1848.

"O. nigra—Black Otary." [Encyclo. Metropolitana, London, 1848, Fig. 2, pl. ix, p. 109]

[Evidently drawn from an alcoholic or air-dried specimen of an *Arctocephalus* pup, in its black natal coat.—H. W. E.]



THE FUR-SEAL.

(Callorhinus ursinus.)

[Fac-simile of a figure engraved on steel from a drawing by Sidney Edwards based upon Steller's description, published as "Phoca ursina" in the Book of Nature, vol. i, pl. 53, Phila., 1834. This is, in its aggregate, one of the best figures of the Fur-seal given to the world prior to my life-studies on the Pribylov Islands, 1872–'76, inclusive.—H. W. E.]

21.—EPITOME OF SPECIAL REPORTS UPON THE SEAL-ISLANDS IN THE ARCHIVES OF THE TREASURY DEPARTMENT.

THE OFFICIAL FILES OF THE TREASURY DEPARTMENT.—The first direct reports received by the government from its agents were those of Charles Bryant and H. H. McIntyre, each dated November 30, 1869, and addressed to the Secretary of the Treasury; they were published by order of Congress January 26, 1870. (See Ex. Doc. No. 32, 41st Congress, 2d session.) The references made to the seal-life in these documents are very brief and general.

On the 30th December, 1870, the next communication from the seal-islands touching the condition of the animals, etc., was received by the Treasury Department from its agent, Mr. S. N. Büynitsky; it is a very brief review of the whole state of affairs. (See Ex. Doc. No. 83, 44th Congress, 1st session, pp. 41 and 44 inclusive.) This is followed on November 10, 1871, by another report upon the same subject by Charles Bryant, still brief and general. (Ex. Doc. No. 83, 44th Congress, 1st session, pp. 59 and 66 inclusive.) It is a mere synopsis of the success of the sealing season, and is followed by another routine report by the same author, dated August 15, 1872, of the same vague and general tenor.

A series of brief annual reports of this character by the agents of the Treasury Department have been annually received by the government from Messrs. Bryant, Morton, and Otis, respectively, up to date, being all restricted to short business recapitulations of the season's work in sealing, condition of the natives, etc.; they are supplemented and illustrated by the reports made by the assistant special agents of the Treasury Department, who address their communications to the treasury agent in charge, or chief special officer of the government.

The last two annual reports of Colonel Otis, special agent Treasury Department, are elaborated in regard to the details of sealing-labor and figures of the progress of the work itself. He gives no special attention to the life and habits of the fur-seal in his communication to the Secretary.

I. ILLUSTRATIVE AND SUPPLEMENTAL NOTES.

22. THE RUSSIAN SEAL-ISLANDS, BERING AND COPPER, OR THE COMMANDER GROUP.

EXTRACTED FROM PROFESSOR NORDENSKIÖLD'S REPORT IN REFERENCE TO BERING ISLAND

[Translated by Capt. G. Niebaum.]

ARRIVAL OF NORDENSKIÖLD: LOCATION OF BERING ISLAND.—The Vega anchored on the 14th August, 1879, in a rather poor, open harbor on the northwest coast of the island. Bering island is the most westerly of the Aleutian islands, and is situated nearest Kamtchatka; it does not belong, nor does the neighboring Copper island, to America, but to Asia, and is controlled by Russia; nevertheless, the American Alaska Company have obtained the hunting privilege, and maintain here a not inconsiderable trading-station, which consists of about 300 inhabitants, supplying them with provisions and manufactured goods, and from them in turn receiving their labor, principally rendered in taking skins of the eared-seal, or sea-bear (*Otaria ursina*); between 40,000 and 100,000* of

* These figures are in error; the table given at the close of this translation will show it. It is well known that the fur-seal, as it bred, was first seen and described by Steller, who wrote his description on this island, when shipwrecked there with Bering, in 1741–'42. Steller's account and the stories of the survivors drew a large concourse of rapacious hunters to the Commander islands; they appear, as near as I can arrive at truths, from the scanty record, to have quickly exterminated the sea-otters, and to have killed many and harrassed the other fur-seals entirely away from the island; so that there was an interregnum between 1760 and 1786, during which time the Russian promyshleniks took no fur-seals, and were utterly at loss to know whither these creatures had fled from the islands of Bering and Copper. When they (the seals) began to revisit their haunts on the Commander islands, I can find no specific date; but I am inclined to believe that they did not reappear on Bering and Copper islands to anything like the number seen by Steller, until 1837–'38; perhaps have not done so until quite recently. At least, in 1867, the Russians did not think more than 20,000 skins could be secured there annually, while they declared 100,000 could be taken readily at the Pribylovs; again, since 1867 the capacity of the Commander group has gradually increased from 15,000 to 20,000, then to 40,000 and 50,000 "holluschickie" per annum. Now, this striking improvement is due, doubtless, to the superior treatment of the whole business by the Alaska Commercial Company, which had also leased these interests from the Russian government in 1871 for a term of 20 years. I think, therefore, that when the fur-seals on the Commander islands became so ruthlessly hunted and harrassed shortly after Steller's observations in 1742, then they soon repaired, or rather most of the survivors did, to the shelter and isolation of the Pribylov group, which was wholly unknown to man; and it remained so until 1786–'87. Then succeeded a period between, up to 1842–'45, when the unhappy seals had but little rest or choice between the Commander and the Pribylov islands, and must have sadly diminished, as the record shows, in numbers.

The unfortunate overland journey of Steller, which alternately starved and froze him into a low fever that ended his young and promising life in a yourt on the Siberian steppes, November 12, 1745, six years prior to the first publication of his celebrated notes on the